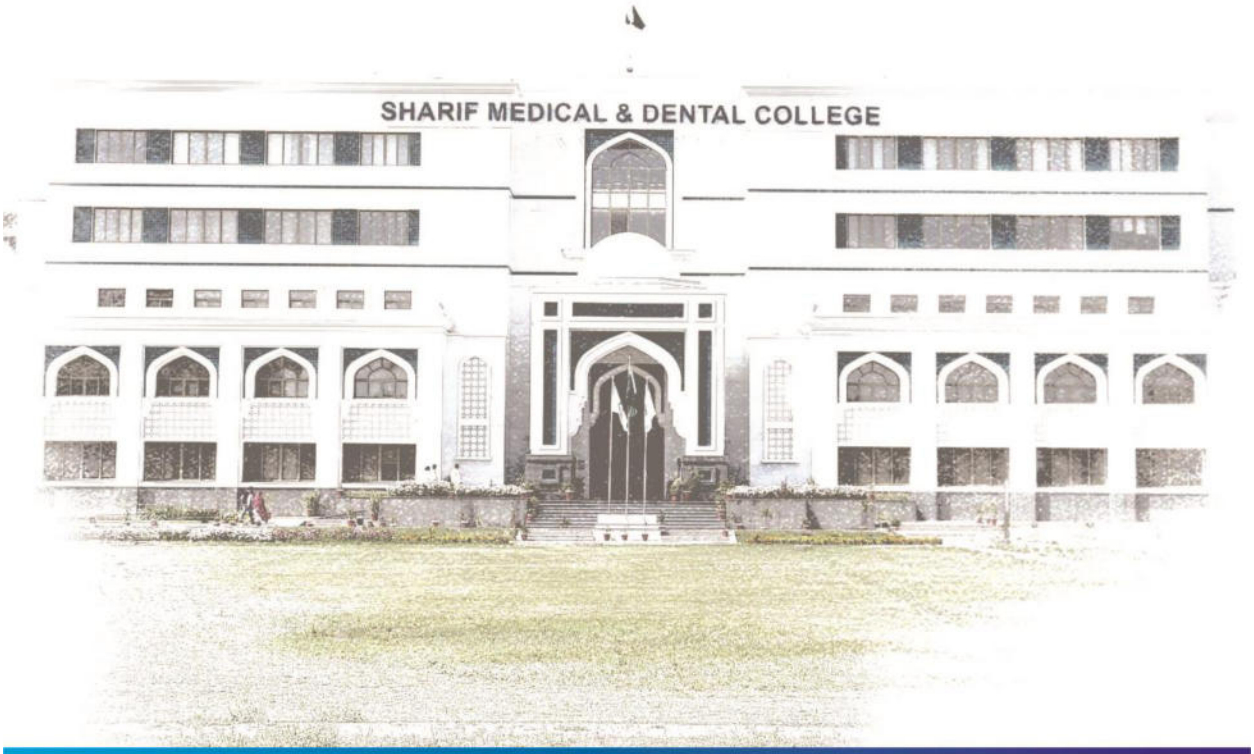
ISSN 2411-5096

JSMDC

Journal of Sharif Medical & Dental College



01/ Vol.4 June 2018

JSMDC

Journal of Sharif Medical & Dental College

Volume 04 | Number 01 | June 2018

The JSMDC is published *biannually* by
Sharif Medical & Dental College
Lahore, Paksitan.

Editorial Correspondence should be addressed to
Editor JSMDC
Sharif Medical & Dental College
Sharif Medical City Road,
Off Raiwind Road, Jati Umra,
Lahore 54000, Pakistan.

Tel
(+92-42) 111-123-786

Fax
(+92-42)37860122

E-mail
editor@jsmdc.pk

Website
www.jsmdc.pk

Published by
ALIGARH Publishers
Ghalib Market, Gulberg III,
Lahore 54660
Ph:042-35771801-8
www.aligarh.com.pk

Annual Subscription Fee:
Pakistan: Rs 1000/-
US $: $ 100/-
UK £: £ 75/-

Editorial

Crimean-Congo hemorrhagic fever (CCHF): An Epidemic-Prone Emerging Infectious Disease

Shahid Iqbal

Viral hemorrhagic fever (VHF) is one of the clinical illnesses posing a grave threat to humans and animals. One of the several VHFs is Crimean-Congo hemorrhagic fever (CCHF), a severe and extremely contagious,zoonotic viral disease caused by Nairovirus.[1] The CCHF viruses belong to Bunyaviridae family and classified into seven genotypes.[2] It is transmitted by the tick of Hyalomma genus.[3] The virus has been found in 31 species of Ixodidae ticks family. The reservoirs of CCHF disease are domestic and wild animals e.g livestock animals, hares and hedgehogs that harbor the tick vectors.[4] The disease is usually asymptomatic in animals but carries high mortality in humans (15-50%).[3]

The illness is prevalent in several countries in Europe, Africa, Asia, Kosovo, Albania, South Africa, Iran and Pakistan.[5] The illness is milder in South Russia with 5-10% mortality rate, but the mortality rates in the Middle East and South Asia were reported 35% and 35-50% respectively. World Health Organization (WHO) has listed Crimean-Congo hemorrhagic fever among rising illnesses for which prevention and control measures must be revitalized and intensified. As per agreement measures, 5 countries recently having the robust proof for CCHF presence are Iran, Turkey, Afghanistan, Pakistan and Tajikistan.[6]

The first CCHF case in Pakistan was reported in 1976; multiple sporadic cases and epidemic have occurred till now.[7] Infection usually occurs as sporadic cases, mostly transmitted to humans through the bite of an infected tick or from contact with the blood of infected animals, principally among abattoir workers. Person-to-person transmission can occur through contact with the virus containing secretions and blood of a patient.[8]

Humans can acquire the infection by contact with animal blood or tissues. Human-to-human transmission can also occur in hospital setups due to exposure to patient's blood and body fluids.[4] Crimean-Congo hemorrhagic fever is work-related illness for slaughterhouse employees, butchers, animal husbandry staff, livestock workers, healthcare providers and veterinarian.[9] During a survey carried out in the area of South Iran, farm animals were recognized as a cause of infection. Crimean-Congo hemorrhagic fever endemic happened through exposure to tissue and infected livestock blood.[6]

The course of CCHF can be divided into prodromal phase, hemorrhagic and convalescent phases. After a tick bite, the incubation period is from 1-6 days, while it is 5-7 days after direct contact with blood or tissues of infected animals or humans. Patients develop symptoms of the sudden onset of fever, weakness, headache, muscular pain, vomiting, hyperemia of the face and oropharynx, a hemorrhagic rash initially then ecchymoses and bleeding from the nose, throat, gastrointestinal tract and other sites.[8] In the first week of illness, there is leucopenia and thrombocytopenia. As the disease progresses, hepatomegaly along with raised liver enzymes and the renal impairment with elevated blood urea nitrogen (BUN) and serum creatinine level occurs.[3] The diagnosis of CCHF is made by polymerase chain reaction (PCR) to detect viral RNA (ribonucleic acid) and virus-specific IgM and/or IgG by ELISA (enzyme-linked immunosorbent assay).[8]

Most of CCHF patients are either asymptomatic or have a non-specific febrile illness which does not require hospitalization or treatment. A few number of patients who develop hypotension and hemorrhage are provided with supportive treatment i.e. intravenous fluids for volume replacement and fresh frozen plasma, platelets and fresh blood transfusion for coagulation abnormalities.[8] For high-grade fever, paracetamol can be given and there is the recommendation for use of anti-ulcer drugs for gastrointestinal bleeding. Antiviral treatment with Ribavirin may be tried. Postexposure prophylaxis with ribavirin in high-risk setting may be considered.[10] Development of the vaccine for prevention of CCHF is in progress.[11]

Factors mostly responsible for the spread of the virus in the domestic cattle are the unhygienic condition of slaughterhouses and breeding places, failure to understand the significance of animal sanitation and their protection from ticks and breeding them near the wild animals. Inadequate knowledge regarding tick-borne illness among butchers, general public and

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Muhammad Shahid Iqbal
Professor Department of Community Medicine
Sharif Medical & Dental College
E-mail: shahid.iqbal@sharifmedicalcity.org

Received: April 25, 2018; Accepted: April 30, 2018.

breeders is the leading cause of its spread among humans. Steps are required to uphold sanitation in pre-designated markets, ensuring that animals are free from the ticks via utilizing acaricides (pesticides that kill mites and ticks) observed to be free from tick for 14 days before being slaughtered. Butchers must be educated to take protective measures while slaughtering and handling the meat of animals. Biosafety measures are of immense importance for the prevention of nosocomial infections. Universal precautions must be exercised in hospitals with ample stock of ribavirin. Special preventive measures are direly needed on the occasion of Eid-ul-Azha. Safe burial practices for the infected deceased and safe disposal of animal's vestiges needs to be extremely emphasized.[1]

REFERENCES

1. Aziz TAG, Ali DJ, Jaff DO. Molecular and serological detection of Crimean-Congo hemorrhagic fever virus in Sulaimani Province, Iraq. J Biosci Med. 2016; 4:36-42.

2. Qidwai W. Crimean-Congo hemorrhagic fever: an emerging public health care challenge in Pakistan. J Coll Phys Surg Pak. 2016; 26(2):81-2.

3. Tipu HN. Immunoinformatic analysis of Crimean-Congo hemorrhagic fever virus glycoproteins and epitope prediction for synthetic peptide vaccine. J Coll Phys Surg Pak. 2016; 26(2):108-12.

4. Appannanavar SB, Mishra B. An update on crimean congo hemorrhagic fever. J Glob Infect Dis. 2011 Jul-Sep; 3(3):285-92.

5. Krasniqi M, Bino S. Clinical and laboratory findings of Crimean-Congo hemorrhagic fever in Albania in 2013-2015. Int J health Sci. 2016; 4(1):31-4.

6. Salimi M, Afshar AA, Limoee M, Babakhani S, Chatrabgoun O, Hanafi-Bojd AA, et al. Knowledge, attitude and practice of health care workers concerning Crimean-Congo hemorrhagic fever in Western Iran. Asian Pac J Trop Biomed. 2016; 6(6):546-50.

7. Alam MM, Khurshid A, Sharif S, Shaukat S, Suleman RM, Angez M, et al. Crimean-Congo hemorrhagic fever Asia-2 genotype, Pakistan. Emerg Infect Dis. 2013; 19(6):1017-9.

8. Bente DA, Forrester NL, Watts DM, McAuley AJ, Whitehouse CA, Bray M, et al. Crimean-Congo hemorrhagic fever: history, epidemiology, pathogenesis, clinical syndrome and genetic diversity. Antiviral Res. 2013; 100:159-89.

9. Yolcu S, Kader C, Kayipmaz AE, Ozbay S, Erbay A. Knowledge level regarding Crimean-Congo hemorrhagic fever among emergency healthcare workers in an endemic region. J Clin Med Res. 2014; 6(3):197-204.

10. Leblebicioglu H, Bodur H, Dokuzoguz B, Elaldi N, Guner R, Koksal I, et al. Case management and supportive treatment for patients with Crimean-Congo hemorrhagic fever. Vector borne Zoonotic Dis. 2012; 12(9):805-11.

11. Buttigieg KR, Dowall SD, Findlay-Wilson S, Miloszewska A, Rayner E, Hewson R, et al. A novel vaccine against Crimean-Congo hemorrhagic fever protects 100% of animals against lethal challenge in mouse model. PLoS One. 2014; 9:e91516.

Original Article

Metabolic Abnormalities in Patients with Beta Thalassemia Major

Maria Aslam, Farooq Azam Khan, Salma Haq

ABSTRACT

Objective: To assess the metabolic abnormalities in patients with beta thalassemia major.

Methodology: It was a cross-sectional study conducted at Department of Pathology in collaboration with Department of Orthopedic Surgery, Sharif Medical and Dental College, Lahore. Thirty diagnosed patients of beta thalassemia major of age 5-11 years were included in this study by random sampling technique. All the patients were transfused regularly and were taking desferrioxamine. Complete blood counts, serum ferritin, liver function tests, corrected serum calcium, serum phosphorus, serum vitamin D and parathyroid hormone levels were measured.

Results: The study included 30 patients of beta thalassemia major with the mean age of 11.45±5.1 years. Eighteen patients were males and 12 were females. Serum ferritin was significantly raised in all patients. Hypophosphatemia, hypocalcemia and 25-OH vitamin D deficiency were found in 11%, 74% and 71% thalassemic patients respectively. Hypoparathyroidism was seen in 11.6% patients whereas hyperparathyroidism was observed in 9.1% patients.

Conclusion: Metabolic abnormalities including hypoparathyroidism, hypocalcemia, hypophosphatemia and vitamin D deficiency occurs in patients with thalassemia major.

Keywords: *Beta thalassemia major. Ferritin. Desferrioxamine. Osteoporosis.*

INTRODUCTION

Thalassemia is the most common inherited hemoglobinopathy worldwide. The most prevalent type of thalassemia in Pakistan is beta thalassemia.[1] Each year almost 70,000 infants are born with beta thalassemia throughout the world. It is prevalent in all Mediterranean countries, Southeast Asia, India, Central America, Africa and the Middle East. It was estimated that 5000-9000 children are born with β thalassemia major in Pakistan every year and carrier rate is 5-7%.[1,2] It is an autosomal recessive genetic disorder and is characterized by severe hemolytic anemia associated with skeletal abnormalities. Patients with beta thalassemia major require regular blood transfusions and present with growth failure, osteopenia and fractures.[3] Thalassemia used to be a fatal disorder but with regular blood transfusions and iron chelation therapy life expectancy of these patients is prolonged. Despite all therapeutic advancements, secondary hemochromatosis is still a major challenge.[4]

Bone disease is an important cause of morbidity in thalassemic patients. Various skeletal abnormalities including osteoporosis, osteopenia, rickets, scoliosis, spinal deformities, nerve compression and spontaneous fractures are seen in these patients.[5] Several factors can cause osteopenia in these patients such as bone marrow expansion due to ineffective erythropoiesis and thinning of adjacent bone, delayed puberty and hypogonadism.[6] Several endocrine disorders occur in patients with beta thalassemia major.

Hemochromatosis is the leading cause of endocrine abnormalities.[7] It decreases mineral deposition and causes accumulation of iron in the osteoblasts that result in osteopenia. Osteoporosis and decreased bone mineral density have also been reported in thalassemic patients. Sex hormones play an important role in bone metabolism. Hypogonadism and delayed puberty are involved in early development of osteoporosis. Secondary endocrinopathies such as growth hormone deficiency, hypo/hyperparathyroidism and diabetes mellitus are also seen in these patients.[8,9]

The prevalence of beta thalassemia major is high in Pakistan and it is associated with significant morbidity. Bone and endocrine complications are highly prevalent in thalassemic patients. The underlying cause of the bone disease is attributed to several factors including ineffective erythropoiesis, bone marrow expansion, calcium & vitamin D deficiency, metabolic dysfunctions due to iron overload and reduced physical activity. Regular monitoring, treatment and follow-up of the patients are required to prevent these complications. Early recognition of metabolic abnormalities leads to successful management of patients. So, this study was planned to assess the metabolic abnormalities in patients with beta thalassemia major.

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Maria Aslam
Associate Professor Department of Pathology
Sharif Medical & Dental College
E-mail: dr.mari@hotmail.com

Received: April 30, 2018; Accepted: May 22, 2018

METHODOLOGY

It was a cross-sectional study conducted at Department of Pathology in collaboration with Department of Orthopedic Surgery, Sharif Medical and Dental College, Lahore. With the approval by the ethics committee of the institution, 30 diagnosed patients of beta thalassemia major of age 5-11 years were included in this study by random sampling technique. All the patients were transfused regularly and were taking desferrioxamine. The diagnosed patients of heart, kidney, liver, thyroid disease or diabetes mellitus were excluded from the study. The blood sample of the patients was taken by using aseptic techniques. Complete blood counts, serum ferritin, liver function tests, corrected serum calcium, serum phosphorus, serum vitamin D and parathyroid hormone levels were measured. Complete blood count was performed by Sysmex-1000. Serum ferritin, serum vitamin D levels and intact parathyroid hormone were measured by chemiluminescence method. Liver function tests, serum calcium and serum phosphorus were performed on automated chemistry analyzer Selectra.

STATISTICAL ANALYSIS

The analysis of the data was carried out by using Statistical Package for Social Sciences (SPSS) version 23. Mean & SD was calculated for all quantitative study variables. Frequency and percentages were estimated for qualitative variables. Comparison of categorical data was carried by Chi-square test. A p-value of <0.05 was considered as statistically significant.

RESULTS

The study included 30 patients of beta thalassemia major with the mean age of 11.45±5.1 years. Eighteen patients were males and 12 were females. The mean hemoglobin level of the patients was 7.9±2.1g/dL and hematocrit was 25.2±4.9%. Serum ferritin level was 4810±3219ng/mL. Total bilirubin was 1.6±0.7mg/dL. Serum AST and ALT were 65.5±39.5u/L and 73.7±68.0µ/L respectively. Level of alkaline phosphatase was 365±65UL/L. Results of all laboratory parameters are shown in table 1.

Hypophosphatemia, hypocalcemia and 25-OH vitamin D deficiency were found in 11%, 74% and 71% thalassemic patients respectively. Hypoparathyroidism was seen in 11.6% of patients.

The study parameters were compared and no significant correlation was found between the study variables.

Table 1: Mean values of study variables

Variable	Mean±SD	Reference range
Hemoglobin (g/dL)	7.9±2.1	12–16
Serum ferritin (ng/mL)	4810±3219	20–200
Total bilirubin (mg/ dL)	2.1±0.7	0.3–1.2
Serum AST (µ/L)	65.5±39.5	<40
Serum ALT(µ/L)	73.7± 68.0	7–56
Alkaline phosphatase (UL/L)	365±65	<500
Serum Phosphorus (mg/ dL)	2.3±2.5	2.5–4.5
Corrected Serum Calcium (mg/ dL)	7.9±0.6	8.6–10.2
Parathyroid Hormone Level (pg/mL)	15.5±7.5	12–50
Serum Vitamin D (ng/mL)	21.1±10.6	>30

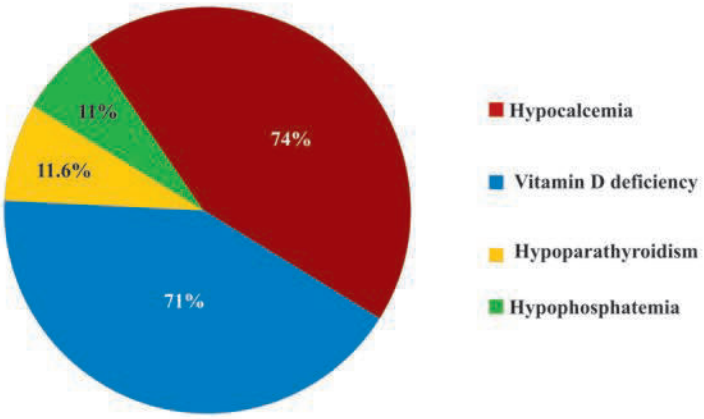


Figure 1: Metabolic abnormalities in the patients with beta thalassemia major

DISCUSSION

Beta thalassemia causes various hematological, endocrinal and skeleton complications. Osteopenia, osteoporosis and spontaneous fractures are the most common skeleton complications. The iron accumulation in anterior pituitary decreases hormonal emission, leading to various endocrine dysfunctions. The metabolic abnormalities include hypoparathyroidism, hypocalcemia, hypophosphatemia and vitamin D deficiency.[10,11]

Our results showed that ferritin levels are raised in these patients. Elevated serum ferritin levels were reported in many other studies due to repeated blood transfusion, which leads to iron overload.[12,13]

We found that serum alkaline phosphatase was not increased in study participants, which indicates the decreased osteoblastic activity of bone. This may occur due to iron accumulation in the osteoblasts. Another study conducted by Stefano et al. showed that alkaline phosphatase did not show significant change from baseline.[4]

Serum vitamin D levels were decreased in 71% patients enrolled in our study. Similar results were found in other studies.[1,9,14] Another study conducted in Italy showed vitamin D deficiency in 9.6% thalassemic patients.[15] Vitamin D deficiency in thalassemic patients is multifactorial. It may occur due to decreased dietary intake, malabsorption or iron overload in the liver which may lead to defective hydroxylation of vitamin D.[1,17]

Our results showed that hypoparathyroidism was seen in 11.6% patients. Low levels of parathormone are sequel of iron overload. Early iron chelation can prevent development of hypoparathyroidism.[10] A study conducted in Southern Pakistan showed the prevalence of hypoparathyroidism in 13.8% patients.[1] Another study conducted in Pakistan found that hypoparathyroidism was present in 40% of patients.[18] A study conducted in Oman showed hypoparathyroidism in 19% thalassemic.[19]

The corrected calcium level was low in our study population. We found hypocalcemia in 74% thalassemic patients. Comparable results were found in other studies conducted in Iran, Saudi Arabia and the USA.[8,20,21] Hypocalcemia occurs in these patients due to hemosiderosis and desferrioxamine therapy. On the contrary, some studies conducted on thalassemic patients showed no significant decrease in calcium levels.[4,22]

We found hypophosphatemia in 11% patients whereas in 89% thalassemic patients serum phosphorous level was within normal range. Another study conducted in Southern Pakistan showed that only 13.8% of patients had hypophosphatemia.[1] Similar results were revealed by other studies conducted in different countries.[4,23] A study conducted in Turkey showed hyperphosphatemia in thalassemic patients.[9] Significantly high serum phosphorus levels were reported in other studies.[24,25]

Endocrine abnormalities like hypogonadism, delayed puberty and diabetes mellitus are commonly seen in thalassemia patients. Osteoporosis leading to fractures is a common bone complication of thalassemic patients. It occurs due to decreased bone formation and increased bone resorption. Iron overload and malnutrition are associated with increased rates of osteoporosis in these patients.[4] Calcium, phosphorous and vitamin D in sufficient amounts are required for bone growth and development. Hypoparathyroidism can also lead to hypocalcemia and osteoporosis. All these factors observed in this study showed that these patients are at risk of developing osteopenia and osteoporosis. **High prevalence of endocrine and metabolic complications among thalassemic patients signifies the importance of therapeutic interventions.** However, further studies are required with a larger sample size and follow-up of the patients.

CONCLUSION

Metabolic abnormalities including hypoparathyroidism, hypocalcemia, hypophosphatemia and

vitamin D deficiency occurs in patients with thalassemia major. Hypocalcemia is the most common metabolic derangement.

RECOMMENDATIONS

Regular monitoring of biochemical profile and treatment with nutritional supplementation like calcium and vitamin D are recommended in thalassemic patients. So that skeleton complications can be prevented in these patients.

REFERENCES

1. Sultan S, Irfan SM, Ahmed SI. Biochemical markers of bone turnover in patients with β-thalassemia major: a single center study from Southern Pakistan. Adv Hematol. 2016; 2016:5437609.

2. Majeed T, Akhter AM, Nayyar U, Riaz SM, Mannan J. Frequency of β-thalassemia trait in families of thalassemia major patients, Lahore. J Ayub Med Coll Abbottabad. 2013; 25(3-4):58-60.

3. Sultan S, Irfan SM, Kakar J, Zeeshan R. Effect of iron chelator desferrioxamine on serum zinc levels in patients with beta thalassemia major. Malays J Pathol. 2015 Apr; 37(1):35-8.

4. Di Stefano M, Chiabotto P, Roggia C, Garofalo F, Lala R, Piga A, et al. Bone mass and metabolism in thalassemic children and adolescents treated with different iron-chelating drugs. JBoneMiner Metab. 2004; 22(1):53-7.

5. Sara M, Syed S, Ahmed N. Complications in transfusion-dependent patients of β-thalassemia major. Pakistan Journal of Medical Sciences. 2009; 25(4):678-82.

6. Salama OS, Al-Tonbary YA, Shahin RA, Eldeen OA. Unbalanced bone turnover in children with beta-thalassemia. Hematology. 2006 Jun; 11(3):197-202.

7. Adil A, Sobani ZA, Jabbar A, Adil SN, Awan S. Endocrine complications in patients of beta thalassemia major in a tertiary care hospital in Pakistan. J Pak Med Assoc. 2012 Mar; 62(3):307-10.

8. Shamshirsaz AA, Bekheirnia MR, Kamgar M, Pourzahedgilani N, Bouzari N, Habibzadeh M, et al. Metabolic and endocrinologic complications in beta-thalassemia major: a multicenter study in Tehran. BMC Endocr Disord. 2003 Aug 12; 3(1):4.

9. Aslan I, Canatan D, Balta N, Kacar G, Dorak C, Ozsancak A, et al. Bone mineral density in thalassemia major patients from Antalya, Turkey. Int J Endocrinol. 2012; 2012:573298. doi: 10.1155/2012/573298. Epub 2012 Jun 20.

10. Saboor M, Qudsia F, Qamar K, Moinuddin M. Levels of calcium, corrected calcium, alkaline phosphatase and inorganic phosphorus in patients' serum with β-thalassemia major on subcutaneous deferoxamine. J Hematol Thromb Dis. 2014; 2(2).

11. Toumba M, Skordis N. Osteoporosis syndrome in thalassemia major: an overview. J Osteoporos. 2010 May 26; 2010:537673. doi: 10.4061/ 2010/ 537673.

12. Ikram N, Hassan K, Younas M, Amanat S. Ferritin levels in patients of beta thalassemia major. International Journal of Pathology. 2004; 2(2):71-4.

13. Giardina PJ, Grady RW. Chelation therapy in -thalassemia: an optimistic update. Hematol. 2001; 38:360-6.

14. Napoli N, Carmina E, Bucchieri S, Sferrazza C, Rini GB, Di Fede G. Low serum levels of 25-hydroxy vitamin D in adults affected by thalassemia major or intermedia. Bone. 2006 Jun; 38(6):888-92. Epub 2006 Feb 7.

15. Soliman A, Adel A, Wagdy M, Al Ali M, ElMulla N. Calcium homeostasis in 40 adolescents with beta-thalassemia major: a case-control study of the effects of intramuscular injection of a megadose of cholecalciferol. Pediatr Endocrinol Rev. 2008 Oct; 6 Suppl 1:149-54.

16. Vogiatzi MG, Macklin EA, Trachtenberg FL, Fung EB, Cheung AM, Vichinsky E, et al. Differences in the prevalence of growth, endocrine and vitamin D abnormalities among the various thalassemia syndromes in North America. Br J Haematol. 2009 Sep; 146(5):546-56.

17. Pirinccioqlu AG, Akpolat V, Koksal O, Haspolat K, Soker M. Bone mineral density in children with beta-thalassemia major in Diyarbakir. Bone. 2011 Oct; 49(4):819-23.

18. Chern JP, Lin KH. Hypoparathyroidism in transfusion-dependent patients with β-thalassemia. J Pediatr Hematol Oncol. 2002 May; 24(4):291-3.

19. Angelopoulos NG, Goula A, Rombopoulos G, Kaltzidou V, Katounda E, Kaltsas D, et al. Hypoparathyroidism in transfusion-dependent patients with β-thalassemia. J Bone Miner Metab. 2006; 24(2):138-45.

20. Aleem A, Al-Momen AK, Al-Harakati MS, Hassan A, Al-Fawaz I. Hypocalcemia due to hypoparathyroidism in β-thalassemia major patients. Ann Saudi Med. 2000 Sep-Nov; 20(5-6):364-6.

21. Vogiatzi MG, Autio KA, Mait JE, Schneider R, Lesser M, Giardina PJ. Low bone mineral density in adolescents with β-thalassemia. Ann N Y Acad Sci. 2005; 1054:462-6.

22. Mahachoklertwattana P, Chuansumrit A, Choubtum L, Sriphrapradang A, Sirisriro R, Rajatanavin R. Bone mineral density in children and young adults with β-thalassemia trait. J Pediatr Endocrinol Metab. 2002 Nov-Dec; 15(9):1531-5.

23. Eren E, Yilmaz N. Biochemical markers of bone turnover and bone mineral density in patients with β-thalassaemia major. Int J Clin Pract. 2005 Jan; 59(1):46-51.

24. Al-Elq AH, Al-Saeed HH. Endocrinopathies in patients with thalassemias. Saudi Med J. 2004 Oct; 25(10):1347-51.

25. Fahim FM, Saad K, Askar EA, Eldin EN, Thabet AF. Growth parameters and vitamin D status in children with thalassemia major in Upper Egypt. Int J Hematol Oncol Stem Cell Res. 2013; 7(4):10-4.

Original Article

Efficacy and Safety of 40% Glycolic Acid Peels in Patients with Melasma

Uzma Ahsan, Samina Khan, Ammara Azeem

ABSTRACT

Objective: To determine the efficacy and safety of 40% glycolic acid peels in patients with melasma in Asian Skin.

Methodology: Sixty patients of either gender with melasma of any type (epidermal, dermal, and mixed); having Fitzpatrick's skin type IV and V were included in the study. They were evaluated by Wood's lamp examination before the commencement of therapy. Before, during and after treatment photographs of the patients were also taken after informed and written consent. A total of eight sessions were done at 2 weeks interval. Melasma Area and Severity Index (MASI) score was calculated before and at the end of sessions. Patients were carefully observed for any side effects during the procedure and on follow-up visit. Efficacy was assessed 4 weeks after the last session.

Results: Out of 60 patients, 5(8%) were males and 55(92%) were females. Age ranged from 20 to 44 years (mean 30.4±5.8 years). Eight (13.33%) patients had mixed type of melasma, 45(75%) patients presented with epidermal and only 7(11.7%) had dermal melasma. The MASI score declined significantly after the end of peeling sessions ($p<0.05$). Assessment of efficacy using 4-grade analysis score was also done. Out of 60, 16.7% patients had excellent improvement, good, fair and poor response was observed in 68.3%, 11.7% and 3.3% respectively. Safety was assessed by evaluating the side effects. Majority of the patients had no significant side effects. The only reported side effects were transient erythema and mild burning.

Conclusion: Peeling with 40% glycolic acid is effective and safe in the treatment of melasma in Asian skin types.

Keywords: *Melasma. Glycolic acid. Chemical peeling.*

INTRODUCTION

Melasma is a chronic cutaneous disorder of acquired hyperpigmentation, which is frequently observed to be refractory to the most of the available treatment modalities. It produces significant psychological impact on the quality of patient's life and the management is frequently exigent.[1] Treatment of this acquired disorder of hyperpigmentation commonly involves a multimodality approach. It is essential to understand the chronic and resistant nature of the disease and counsel the patient about the significance of photoprotection, the role of hormonal imbalance, iron deficiency, topical steroid application and other factors before the commencement of any therapy.[2]

A wide range of therapies have been used in the management of this disorder with inconsistent results globally, due the variations in patient's skin type and the type of melasma. These comprise the use of broad spectrum sunscreens combined with topical depigmenting agents like hydroquinone, retinoic acid, azelaic acid, kojic acid, flavonoid extracts, fish oil, green tea, deoxyarbutin and liquiritin.[3] Chemical peels are frequently considered to be second line therapy. Patients who are refractory to the above mentioned modalities can be considered for the use of lasers and light therapies.[4] Chemical peels act by producing a restricted epidermal injury involving the disintegration of organization between the keratinocytes followed by rejuvenation. This process eventually facilitates the removal of epidermal melanin and also halts melanosome transfer to keratinocytes. This controlled exfoliation is followed by regeneration of epidermis and dermis.[5]

Both local and international literature establishes the efficacy of chemical peeling in augmenting the effect of the other topical depigmenting agents and reducing the MASI considerably.[6] They are, therefore considered to be one of the most popular aesthetic procedures in America and superficial chemical peels have recently been demonstrated to be efficacious in Asian skin as well in various conditions.[7]

Among the various well-accepted peeling agents used in dermatology are the Alpha-hydroxy peels. They have the advantage of having minimal downtime. Glycolic acid (GA), derived from sugar cane is also known as fruit acid, has the smallest molecular weight amongst all the alpha-hydroxy acids. It is hydrophilic agent with a pH ranging from 0.08–2.75 (non-buffered solution).[4] Review of literature suggests the use of a buffered or partly neutralized GA, which has a superior safety profile than free GA. These are available in different concentrations ranging from 20%–70%. Higher concentrations have lower pH, and produce deeper desquamation.[8] Peels with GA were classified as: very superficial (30%–50% GA, applied for 1–2 minutes);

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Uzma Ahsan
Associate Professor Department of Dermatology
Sharif Medical & Dental College
E-mail: uzma_ahsan@yahoo.com

Received: April 30, 2018; Accepted: May 22, 2018

superficial (50%–70% GA, applied for 2–5 minutes); and medium depth (70% GA, applied for 3–15 minutes). Various concentrations of GA have been used in the treatment of melasma both locally as well as globally with promising results.[9,10,11]

A variety of chemical peeling agents have been used in the local context with established efficacy in treatment of melasma. We planned to evaluate the efficacy and safety of 40% glycolic acid in patients with melasma in our set-up.

METHODOLOGY

The study was conducted in the Department of Dermatology, Sharif Medical & Dental College, Lahore. A total of 60 patients were included in the study. It was a quasi-experimental study started after approval from ethical review board of the hospital. Sixty patients of either gender with melasma of any type (epidermal, dermal, and mixed); having Fitzpatrick's skin type IV and V were included in the study. Random sampling technique was used. They were evaluated by Wood's lamp examination before the commencement of therapy. They were enrolled from outpatient department. Before, during and after treatment photographs of the patients were also taken after informed and written consent.

Patients who were unable to avoid excessive solar exposure, patients with underlying systemic disease or pregnant and lactating females, those using contraception & hormonal therapy or already taking topical or systemic medicine for melasma were excluded. All selected patients were briefed about the nature and possible side effects of the procedure. They were recommended to avoid the application of cosmetic products or any other topical medicine during the study period. All the enrolled patients had a pre-peel priming of the skin for three weeks consisting of a regular application of a broad spectrum sunscreen during daytime and tretinoin 0.05% cream at night for two weeks (stopped 1 week before the procedure). The MASI score was calculated before the peeling was done. A total of eight sessions were done at 2 weeks interval and MASI score was re-calculated at the end of sessions. Patients were carefully observed for any side effects during the procedure and on follow-up visit. After washing the face with soap and water, it was dried using sterilized gauze. A layer of the peeling agent was then applied with a cotton swab, using gentle movements to ensure the even distribution of peeling solution. The solution was left for 3 minutes and then washed with water. Patients were explained in detail about the post procedure sun protection. They were also instructed to use moisturizer at night following the peeling session. At each visit, compliance was reassured. Baseline MASI score was noted and patients were called at 2 weekly intervals for chemical peeling. The duration of action of sunscreen was fully explained to the patients. Patients were called after every 2 weeks to document the MASI score for assessment and repeat procedure. At the end of 16 weeks, procedure was stopped and final MASI score was noted. At the end of peeling sessions, patients had a follow-up examination at 4 weeks after the last session to assess the effectiveness of the peeling agent on a 4-grade scale. This scale divided the patients into following categories; excellent (>75% improvement), good (50-75% improvement), fair (25-49% improvement) and poor (<25%improvement). Safety was established by assessing the side effects and observing the degree of tolerability to the peel.

STATISTICAL ANALYSIS

The analysis was done using Statistical Package for Social Sciences (SPSS) version 21. Frequencies and percentages for the variables were reported. Significance was tested at a level of 0.05 using chi-square test.

RESULTS

Out of 60 patients, 5(8%) were males and 55(92%) were females. Age ranged from 20 to 44 years (mean 30.4±5.8 years). Eight (13.33%) patients had mixed type of melasma, 45(75%) patients presented with epidermal and only 11.7(12%) had dermal melasma. Majority of the patients were housewives who did not give history of excessive sun exposure. Pre-peeling and post-peeling MASI score was 14.23±4.52 and 8.8±3.2 respectively. The MASI score declined significantly

Table 1: Efficacy of 40% GA using 4-grade analysis score

	Excellent (>75% improvement)	Good (50-75% improvement)	Fair (25-49% improvement	Poor(<25% improvement)	Total
40% Glycolic Acid	10 (16.7%)	41(68.3%)	7(11.7%)	2(3.3%)	60

Table 2: Efficacy of 40%GA with respect to duration and clinical type of melasma

	Excellent (>75% improvement)	Good (50-75% improvement)	Fair (25-49% improvement	Poor(<25% improvement)	Total
Duration of melasma					
1-5 years	7	31	5	2	45
6-10 years	3	10	2	0	15
Type of Melasma					
Dermal	1	4	1	1	7
Epidermal	6	34	4	1	45
Mixed	3	3	2	0	8

after the end of peeling sessions ($p<0.05$). Assessment of efficacy using 4-grade analysis score was also done and results were tabulated in table 1. The efficacy of 40% glycolic acid with respect to the duration and type of melasma is displayed in table 2. Safety was assessed by evaluating the side effects of the peel. Majority of patients (86%) complained only of transient erythema and burning.

DISCUSSION

Melasma is primarily a disease of females. In our study, 92% were females compared to males who were 8%. The finding is similar to the results by Sarkar et al. and Lee et al. They also highlighted female predominance with M:F ratio of 1:3. Pregnancy, oral contraceptive pills, and estrogen-progesterone therapies may be the contributory factors of this condition in females.[12,13] Other factors leading to a higher incidence of melasma in females as compared to males, presenting to outpatient department, can be the over awareness among them regarding cosmetic disfigurement caused by this acquired disorder of hyperpigmentation. Mean age of the study participants was 30.4 years. This was consistent with other studies performed by Ejaz et al.[8] and Bari et al.[9] but in disparity to the study done by Vedamurthy et al.[10] in which the mean age was 42.3 years.

We observed that the duration of melasma had an inversely proportional relation with the response to the therapy. Our results were consistent with the local as well as global data where peeling agents demonstrated to be additionally effective in patients with lesser duration of melasma and those with longer duration were categorized among poor responders.[8,9-11]

Treatment of melasma is challenging, especially in dark skinned individuals.[12] Different modalities are in practice worldwide. In this study, MASI score at the end of peeling sessions was compared with the pre-peeling scores. Peeling with 40% GA demonstrated a significant decline in MASI score $p<0.05$. The MASI score decreased down to a mean of 8.8 from a mean of 14.23. These findings were consistent with the results of Ejaz et al.[8] In international studies by Godse et al. and Erbil et al. mean MASI score also decreased significantly from 19.72 to 10.17 and from 18.67 to 11.30, respectively.[14,16] However, Godse et al. used different strengths of peeling agent and pre-peeling priming. They also used triple combination of tretinoin 0.05%, hydroquinone 4% and mometasone furoate 0.1% along with the serial glycolic acid peels.[14] Similarly, Erbil et al. used serial glycolic acid peels from 35% to 70% along with topical application of azelaic acid.[15] Better results in these studies, could possibly be explained by the use of higher concentrations of GA in these studies and might be the better priming effect of the depigmenting agent. At higher concentrations GA produces a deeper peeling and subsequently better results. Valkova et al. found that 35% glycolic acid (in conjunction with azelaic acid) is equally effective to 15% trichloroacetic acid in reducing MASI score in dark skinned individuals.[6] Comparison of results in reference to the type of melasma revealed a better response in epidermal type of melasma. It was found to be less effective in mixed type of melasma and with no good results in dermal type except 3 patients. These findings were supported by another local study.[7,15]

CONCLUSION

Peeling with 40% glycolic acid is effective and safe in the treatment of melasma in Asian skin types. Further studies are however needed to compare its efficacy with other chemical peeling agents and also combining it with topical depigmenting agents in Asian skin types.

REFERENCES

1. Handel AC, Miot LDB, Miot HA. Melasma: a clinical and epidemiological review. An Bras Dermatol. 2014; 89(5):771-82.

2. Fulton JE, Porumb S. Chemical peels: their place within the range of resurfacing techniques. Am J Clin Dermatol. 2004; 5(3):179-87.

3. Griffiths CE, Finkel LJ, Ditre CM, Hamilton TA, Ellis CN, Voorhees JJ. Topical tretinoin (retinoic acid) improves melasma. A vehicle-controlled, clinical trial. Br J Dermatol. 1993; 129(4):415-21.

4. Zakopoulou N, Kontochristopoulos G. Superficial chemical peels. J Cosmet Dermatol. 2006; 5(3):246-53.

5. Tse Y, Ostad A, Lee HS, Levine VJ, Koenig K, Kamino H, et al. A clinical and histologic evaluation of two medium-depth peels. Glycolic acid versus Jessner's trichloroacetic acid. Dermatol Surg. 1996; 22(9):781-6.

6. Valkova S. Treatment of melasma with glycolic versus Trichloroacetic acid peel: comparison clinical efficacy. Annual Proceedings. J of IMAB. 2004; 10(1):42-4.

7. Saeed W, Altaf F, Rashid S, Rani Z. Efficacy and Safety of 50% glycolic acid peels in the treatment of melasma in Fitzpatrick's skin type IV and V. J of Pakistan Association of Dermatologists. 2016; 26(1):26-30.

8. Ejaz A, Raza N, Iftikhar N, Muzzafar F. Comparison of 30% Salicylic acid with Jessener's Solution for superficial chemical peeling in epidermal melasma. J Coll Physicians Surg Pak. 2008 Apr; 18(4):205-8

9. Bari AU, Iqbal Z, Rahman SB. Tolerance and safety of superficial chemical peeling with salicylic acid in various facial dermatoses. Indian J Dermatol Venereol Leprol. 2005; 71(2):87-90.

10. Vedamurthy M. Salicylic acid peels. Indian J Dermatol Venereol Leprol. 2004; 70(2):136-8.

11. Stratigos AJ, Katsambas AD. Optimal management of recalcitrant disorders of hyperpigmentation in dark-skinned patients. Am J Clin Dermatol. 2004; 5(3):161-8.

12. Sarkar R, Bansal S, Garg VK. Chemical peels for melasma in dark-skinned patients. J Cutan Aesthet Surg. 2012; 5(4):247-53.

13. Lee AY. An updated review of melasma pathogenesis. Dermatologica Sinica. 2014; 32(4):233-9.

14. Godse KV, Sakhia J. Triple combination and glycolic acid peels in melasma in Indian patients. J Cosmet Dermatol. 2011; 10(1):68-9.

15. Erbil H, Sezer E, Tastan B, Arca E, Kurumlu Z. Efficacy and safety of serial glycolic acid peels and a topical regimen in the treatment of recalcitrant melasma. J Dermatol. 2007; 34(1):25-30.

Original Article

Factors Predisposing To Cleft Lip and Palate in Children Presenting in a Tertiary Care Hospital

Areeja Fatima, Asad Zain, Muhammad Tauseef Javed, Muhammad Shahid Iqbal

ABSTRACT

Objective: To determine the predisposing risk factors of cleft lip and palate among children presenting in a tertiary care hospital.

Methodology: It was a case-control study conducted at the Children Hospital & Institute of Child Health, Lahore for a period of 3 months. The study was approved by the ethical committee of the hospital. Purposive sampling was done to obtain 55 cases and 55 controls. Data collection tool employed a questionnaire which was then analyzed by SPSS 22. Frequencies, odds ratios and data were presented in tables.

Results: The mean age of children was found to be 8.25 months. Among the cases, 10(18.2%) cases suffered from cleft lip alone, 23(41.8%) suffered from the cleft palate and 22(40%) suffered from both cleft lip and palate. Two(3.6%) cases also had congenital heart disease. Bivariate analysis of the variables in the study showed that only female gender with a p-value of 0.01, cousin marriage with a p-value of 0.004 and lack of multivitamins/folic acid supplementation during pregnancy with a p-value of 0.034 were significant while differences observed in cases and controls in all other variables were not significant.

Conclusion: Female gender of the child, cousin marriage and lack of multivitamin/folic acid supplementation during pregnancy were found to have a significant association with the development of cleft lip and palate.

Keywords: *Congenital abnormalities. Cleft lip. Cleft palate.*

INTRODUCTION

Cleft lip and palate are among the commonest birth anomalies due to the abnormal facial growth in the fetal life.[1] According to WHO, cleft lip and palate occur 1 in 700 live births worldwide.[2] The incidence is 1 in 600 neonates in United States. Cleft lip can occur with or without cleft palate (CP). In two-thirds of neonates, both cleft lip and palate are present. Cleft lip and palate can be associated with syndromes in which multiples organs are involved.[3] Asians are at higher risk for facial clefts, followed by Caucasians and African Americans.[2,4] In Iran, its prevalence is varied from 0.93 to 1.03 per 1,000 births.[5]

Childbearing is one of the fundamentally imperative physiological properties of life. One of the aims of antenatal care is to ensure the birth of healthy offspring without congenital abnormalities. Congenital abnormalities appearing in the children is a major reason which results in their rejection by the society creating a sense of deprivation/damaged psyche in their personalities and for this very reason, they are not able to contribute as useful individuals.[6]

Cleft lip alone or a cleft lip concomitant with a cleft palate are classified as craniofacial birth abnormalities.[7,8] The cleft in its nature can be unilateral, bilateral, complete or partially complete. The predisposing factors of cleft lip and cleft palate may be ascertained by genome of the parents and can be determined from the phenotyping of both the parents.[9,10] The genetic as well as environmental factors play a role in the development of cleft lip and palate. An estimated 20% of these cases occur as a result of environmental factors and teratogens during the period of embryogenesis. The various predisposing factors are cousin marriages, prenatal exposure to cigarette smoke, alcohol, drugs like phenytoin and isotretinoin, obesity in mother and hereditary influences like race and ethnicity etc.[11,12]

Among the major challenges for a newborn with cleft lip and palate is the characteristic of articulation and formation of normal speech.[13] These abnormalities arise in the syndromic and non-syndromic types and the diagnosis of its associated risk factors is quite complex.[14] The children with cleft lip can develop teeth malformations, malocclusion, abnormalities of the face & the nose, eating, breathing, listening and speech problems.[11] When a cleft palate or cleft lip is identified, feeding is a main issue for the parents of such children. Eating abnormalities manifest at the event of birth as a result of impairment in functions like sucking, swallowing and deglutition functions due to alterations in the normal anatomy. Thus, at this time, monitoring of the infant's feed is the topmost priority of the healthcare provider.[15] These children mostly require surgical treatment at the age of 6-12 months.[9]

There is a lack of knowledge of factors predisposing to cleft lip and palate in children in developing countries.

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Muhammad Shahid Iqbal
Professor Department of Community Medicine
Sharif Medical & Dental College
E-mail: shahid.iqbal@sharifmedicalcity.org

Received: April 15, 2018; Accepted: May 20, 2018.

This study was planned to determine the predisposing factors for cleft lip and palate in children and improve the status of health education of prospective parents as well as society at large to curtail the modifiable risk factors.

METHODOLOGY

It was a case-control study conducted at Children Hospital & Institute of Child Health, Lahore. The study was approved by the ethical committee of the hospital. The estimated sample size calculated using OpenEpi software was 110 (55 cases and 55 controls). Purposive sampling technique was used. The children with cleft lip and palate visiting the Paediatric Surgery Department were included in the study whereas the children visiting OPD and vaccination center of the hospital were enrolled as controls.

All the mothers were interviewed using a questionnaire. Each patient underwent a detailed history and clinical examination. Their demographic profile and clinical features including any other associated congenital anomaly were noted. The presence of congenital cleft lip or cleft palate in siblings or any other relative and the birth order (first born or having elder siblings) in the family were also noted in the history. The history of predisposing factors of cleft lip and palate was also taken. These included mother's and father's age, previous abortions, stillbirths, duration of conception after marriage, consanguinity, smoking, intake of medications, history of mother infections and multivitamin/folic acid supplementation during pregnancy. The same history and examination were done for controls without having oral clefts.

STATISTICAL ANALYSIS

The data was analyzed using Statistical Package for Social Sciences (SPSS) version 22. The variables were analyzed by calculating frequency, mean, standard deviation and percentages. Chi-square test was applied to find out the association between categorical variables and a p-value of ≤0.05 was considered as significant. Odds ratio (OR) along with 95% confidence interval (CI) were calculated for various variables followed by logistic regression to adjust the values.

Table 1: Unadjusted odds ratio of various factors contributing to the development of cleft lip and palate

Variable	Cases	Control	OR	95% CI for OR	p-value
Residence					
Rural	34(55.7%)	27(44.3%)	1.679	0.786-3.585	0.250
Urban	21(42.9%)	28(57.1%)			
Gender					
Female	28(66.7%)	14(33.3%)	3.037	1.358-6.791	0.01*
Male	27(39.7%)	41(60.3%)			
Cousin marriage	35(64.8%)	19(35.2%)	3.316	1.518-7.244	0.004*
Father's education	24(47.1%)	27(52.9%)	0.80	0.3792-1.7	0.56
History of smoking in father	16(53.3%)	14(46.7%)	1.2	0.518-2.785	0.669
History of passive smoking	16(50%)	16(50%)	1	0.4392-2.27	1
History of stillbirth	3(75%)	1(25%)	3.1	0.314-30.9	0.618
History of abortion	8(61.5%)	5(38.5%)	1.7	0.520-5.574	0.556
Anemia in pregnancy	20(48.8%)	21(51.2%)	0.92	0.427-2.0	0.844
History of medication during pregnancy	17(65.54%)	9(34.6%)	2.289	0.916-5.710	0.073
Lack of multivitamins & folic acid supplementation	29(61.7%)	18(38.3%)	2.299	1.05-4.96	0.034*

Significant ($p \leqslant 0.05$)

Table 2: Regression model showing adjusted odds ratio of various predisposing factors contributing to the development of cleft lip and palate

Variables	Unadjusted Odd Ratio	p-value	Adjusted Odd Ratio	p-value
Female gender	3.037(1.358-6.791)	0.001	4.231(1.620-11.048)	0.003
Cousin marriage	3.316(1.518-7.244)	0.004	3.907(1.592-9.591)	0.003
Father income	1.552(0.731-3.296)	0.252	1.000(1.00-1.00)	0.173
History of passive smoking	1(0.439-2.277)	1.00	0.760(0.282-2.209)	0.653
History of abortion	1.7(0.520-5.574)	0.556	1.598(0.401-6.369)	0.506
Anemia in pregnancy	0.92(0.427-2.00)	0.844	0.976(0.349-2.728)	0.963
Maternal illness during pregnancy	2.57(0.955-6.923)	0.057	2.817(0.217-36.608)	0.429
History of medication	2.289(0.916-5.710)	0.073	0.800(0.069-9.301)	0.859
Lack of multivitamins & folic acid supplementation	2.299(1.05-4.96)	0.034	2.888(1.149-7.259)	0.024

RESULTS

Results of the study showed that among the 55 cases and 55 controls, most of the mothers (70.90%) were 20-29 years old and the majority of the fathers were between 25-29 years of age. Regarding mother's age at the time of birth, out of 55 cases, 29(51.8%) was equal to or less than 20 years of age. Thirty four (61.8%) mothers resided in rural areas while 21(38.2%) resided in urban areas in the case group. In the control group, 27(49.1%) and 28(50.9%) resided in rural and urban areas respectively. In our study, 47(85.5%) children were less than 12 months of age and 8(14.5%) were above 12 months in the case group whereas 44(80.0%) were less than 12 months in age and 11(20.0%) were above 12 months in the control group. Twenty seven children (49.1%) were males while 28(50.9%) were females in the case group whereas 41(74.5%) were males and 14 (25.5%) were females in the control group. Twenty eight (50.9%) were underweight in the case group and 31(56.4%) were underweight in the control group. The birth order showed that among the cases, 32(58.2%) children were first or second born in their families whereas in controls, 31(56.4%) children were first or second born. In the case group, only 1(1.8%) child had an elder sibling with cleft lip and palate whereas in control group, all children have normal siblings.

The frequency of birth defects among children showed that among the cases, 10(18.2%) cases suffered from cleft lip alone, 23(41.8%) suffered from the cleft palate and 22(40%) suffered from both cleft lip and palate. Two (3.6%) cases also had congenital heart disease. Mean weight of children was 5.86±2.81 kg with the range of 1.60-14.00 kg.

Bivariate analysis of the variables in the study showed that only female gender with a p-value of 0.01, cousin marriage with a p-value of 0.004 and lack of multivitamins/folic acid supplementation during pregnancy with a p-value of 0.034 were significant whereas differences observed in cases and controls in all other variables were not significant. Among the other variables, residence, congenital heart disease, father's education, history of smoking in father, history of passive smoking, history of stillbirth, history of abortion, anemia in pregnancy and intake of medication with p-values of 0.250, 0.09, 0.56, 0.669, 1, 0.618, 0.556, 0.844 and 0.073 respectively were insignificant (Table 1 and 2).

DISCUSSION

There are various congenital anomalies from which children may suffer at the time of their birth. Cleft lip and palate are amongst the most prevalent forms of congenital birth abnormalities in this regard. Their pathogenesis is multifactorial with a primarily genetic origin with influencing factors like socioeconomic status, race, ethnicity as well as environmental influences. The present study was undertaken to determine the factors predisposing to cleft lip and palate among children presenting to the Children Hospital, Lahore.

In this study, the majority (61.8%) of the fathers were between 25-29 years, mean age being 31.2 years. Similarly, in case of mothers, the majority (70.90%) were between 20-29 years, mean age being 26.42 years. In a similar study by Ahmad et al.

most (49.38%) of the fathers were between 25-34 years old and most of the mothers (74.1%) were between 25-34 years of age.[16]

Our results showed that female gender of the baby, cousin marriage and lack of multi-vitamin/folic acid supplementation during pregnancy were associated with a higher risk of development of cleft lip and palate. Another study was conducted at Holy Family Hospital, Rawalpindi to see the association between consanguinity and congenital birth defects. Out of 176 pregnant or recently delivered women, 78 cases were women with neonates having congenital birth defects and there were 78 matched controls with normal healthy neonates. In this study, odds ratios (OR) and adjusted ORs were computed along with 95% confidence intervals. The results of the study demonstrated that upon comparing consanguinity in cases and controls, it increased the risk of congenital defects by two-fold, odds ratio is 2.23, 95% confidence interval of 1.16-4.27 and p-value 0.01.[13] This is quite similar with the findings of our study in which cousin marriage had an adjusted odds ratio of 3.907, 95% confidence interval of 1.592-9.591 and p-value of 0.003. Consanguineous marriage is a widely studied phenomenon especially in the Pakistani society and the results of various studies regarding congenital birth defects are similar. These findings prompt for a further research into the genetic mechanisms responsible for the generation of birth defects as a result of consanguinity.

In our study, lack of multivitamin and folic acid supplementation was found the third significant predisposing factor for the etiology of cleft lip and palate. This finding is consistent with the findings of a national level and population-based case-control study in Norway which showed that least risk of cleft lip was evidenced in females who consumed folate-rich diet/multivitamin or supplements with adjusted OR 0.36 and 95% CI of 0.17-0.77.[17]

However, one limitation of the current study was that the exact history of multivitamin/folate intake was purely reproduced on recall basis in contrast to the study in Norway, where strong antenatal programs coupled with improved educational and awareness status of women warrant reliable information regarding their status of multivitamin/folate intake.[17] Furthermore, the current study did not differentiate between multivitamins and folate as both are recalled being one or the same thing by the women subjects.

In another study by Acuna-Gonzalez et al. a multivariate analysis was done in Mexico to identify the risk factors for cleft lip and palate. According to them, lower socioeconomic strata, having the birth in the southern areas of the Campeche state, home delivery or natality in a government hospital, having a brother or sister with the non-syndromic cleft lip along with or without cleft palate and a history of infections occurring in the pregnancy were associated with cleft lip and palate. In this study, prenatal care consisting of vitamins and folic acid supplementation was implicated as a protective element for non-syndromic cleft lip with or without cleft palate (odds ratio equal to 0.29) which is consistent with the findings of the current study. This implies that regardless of the socio-demographic and geographical characteristics, multivitamins and folic acid supplementation is essential for protection for birth abnormalities and pregnant women cannot rely solely on their diet for a healthy childbearing process.[18]

CONCLUSION

Female gender of the child, cousin marriage and lack of multivitamin/folic acid supplementation during pregnancy were found to have a significant association with the development of cleft lip and palate.

REFERENCES

1. Kesande T, Muwazi LM, Bataringaya A, Rwenyonyi CM. Prevalence, pattern and perceptions of cleft lip and cleft palate among children born in two hospitals in Kisoro district, Uganda. BMC Oral Health. 2014; 14:104.

2. Maulina I, Akota I. Assessment of the posteroanterior cephalograms of the parents of children with cleft lip and/or cleft palate in Latvi, Stomatologija. Baltic Dental and Maxillofacial Journal. 2011; 13(1):8-14.

3. Abbot MA. Cleft lip and palate. Paediatrics in Review. 2014; 35(5):1-7.

4. Kianifar H, Hasanzadeh N, Jahanbin A, Ezzati A, Kianifar H. Cleft lip and palate: a 30-year epidemiologic study in North-East of Iran. Iran J Otorhinolaryngol. 2015; 27(78):35-41.

5. Jahanbin A, Mokhber N, Sahhafian AA. Seasonal and yearly fluctuations in birth date of cleft lip and palate children in Northern-East of Iran, 1992-2007. Iran J Otorhinolaryngol. 2008; 2051:45-50.

6. Noorbakhsh N, Davari HA, Akochakian SH, Davari M. Comparative evaluation of risk factors in

children with cleft lip and palate and healthy children. J Isf Dent Sch. 2011; 65:526-32.

7. Jamilian A, Nayeri F, Babayan A. Incidence of cleft lip and palate in Tehran. J Indian Soc Pedod Prev Dent. 2007 Oct-Dec; 25(4):174-6.

8. Golalipour MJ, Mohamadiyan S, Taziki MH, Mobasheri E, Borghaei A. Epidemiologic study of cleft in a six-year period in Gorgan 1997-2003. Journal of Babol University of Medical Sciences. 2005; 72:41-7.

9. Abdollahi F S, Shahidi N, Lotfi A. Prevalence of associated anomalies in cleft lip and/or palate patients. Iran J Otorhinolaryngol. 2016; 28(85):135-9.

10. McIntyre GT, Mossey PA. Asymmetry of the craniofacial skeleton in the parents of children with a cleft lip, with or without a cleft palate, or an isolated cleft palate. Eur J Orthod. 2010; 32:177-85.

11. Khazaei M, Ghanbari S, Rezaei M, Alipour AA, Khazaei S. Evaluation of cleft lip and palate frequency and related risk factors in infants born in Kermanshah hospitals 2001- 2008. J Isf Dent Sch. 2010; 64:298-304.

12. Yassaei S, Mehrgerdy Z, Zareshahi G. Prevalence of cleft lip and palate in births from 2003 - 2006 in Iran. Community Dent Health. 2010; 272:118-21.

13. Riaz R, Inayat M, Aslam F. Association of consanguineous marriages with congenital birth defects. Journal of Rawalpindi Medical College Students. 2016; 20(S-1):9-12.

14. Tehranchi A, Kazemi B, Mahjoub B. Association between TGFβ3 mutation and cleft lip/palate in Iranian population. Journal of Dental School, Shahid Beheshti University of Medical Sciences. 2010; 283:160-4.

15. Duarte GA, Ramos RB, Cardoso MCAF. Feeding methods for children with cleft lip and/or palate: a systematic review. Braz J Otorhinolaryngol. 2016 Sep-Oct; 82(5):602-9.

16. Ahmad R, Aziz FN, Humayun H, Ayub A, Bashir I. Demographic and social factors in relation with occurrence of orofacial defects. Med Forum. 2017; 28(6):10-13.

17. Lumley J, Watson L, Watson M, Bower C. Periconceptional supplementation with folate and/or multivitamins for preventing neural tube defects. Cochrane Database Syst Rev. 2008; S3:82-3.

18. Acuna-Gonzalez G, Medina-Solis CE, Maupome G, Escoffie-Ramirez M, Hernandez-Romano J, Islas-Marquez AJ, et al. Family history and socioeconomic risk factors for non-syndromic cleft lip and palate: a matched case-control study in a less developed country. Biomedica. 2011; 31:381-91.

Original Article

Conservative Management versus Skin Grafting in Fingertip Amputations without Bone Exposure

Farooq Azam Khan, Abbas Khan Bajwa, Saqib Raza

ABSTRACT

Objective: To compare conservative treatment with skin grafting in fingertip amputations without bone exposure.

Methodology: It was a randomized control trial conducted at Department of Orthopedic Surgery, Sharif Medical City Hospital, Lahore. The study was approved by the ethical committee of the hospital. Thirty two patients including 6 patients with 2 fingertip injuries were enrolled in the study. The patients were randomly divided into two groups; I and II. Each group included 19 fingertips. The patients in group I and II were managed with dressings and skin grafting respectively. At the end of 3rd & 6th months, they were assessed for defected surface area, average healing time, cold intolerance, infection, hypersensitivity, two-point discrimination, joint stiffness and cosmetic appearance.

Results: The mean age of the patients was 26±11 years ranging from 15-55 years. The healing time was 26 days and 15 days in group I and II patients. An average increase in the two-point discrimination distance of 2.85±0.52 mm in group I and 6.56±0.66 mm in group II was reported. In group I, cold intolerance was observed in 6(32%) fingers after 3 months and in 1(5.2%) finger after 6 months. In group II, 9(47.3%) fingers had cold intolerance after 3 months and 3(15.7%) fingers showed cold intolerance after 6 months. Hypersensitivity was not observed in any finger in group I whereas in group II, 11 fingers were hypersensitive after 3 months. Joint stiffness was absent in group I and present in 7 fingers (36.8%) in group II. Cosmetic outcome was good in group I as compared to group II.

Conclusion: In fingertip injuries without bone exposure, conservative management is better than surgical interventions. However, in larger defects with bone exposure, skin grafting should be considered.

Keywords: *Fingertip injuries. Conservative management. Skin grafting.*

INTRODUCTION

Fingertip (FT) injuries are the most commonly encountered hand injuries.[1,2] The cost of hand injury in American societies is almost 10 million yearly. This also accounts for 90 days of restricted activity and missed work.[3] About 24% of the cases represent fingertip injuries among all hand injuries.[4] The fingertip is the part of the finger distal to the plane of major dorsal and volar skin creases at the level of the distal interphalangeal joint. It is a highly specific structure.[5] Fingertip trauma is one of the most common injuries in industrial as well as domestic setup. Patients present most commonly with upper limb traumatic amputation of the fingertip.[6] The major concern for patients is the loss of length and function of the affected finger. The mechanisms commonly involved include crushing, degloving, avulsions, lacerations, amputation and tendon injuries.[5] Depending on the integrity of overlying skin, FT injuries can be categorized as open or close. Skin is intact and the hematoma is not exposed to the external environment in closed injuries. These injuries can also involve the bone or soft tissues.[7] Distal phalanx fractures, interphalangeal joint dislocations, collateral ligament injuries, avulsion of the tendon can all occur with the closed injury. In open injuries, damage to overlying skin also occurs. The irreversible ischemia leading to gangrene and eventually amputation of the distal portion is a result of high-pressure FT injuries. For the management of FT injuries, different treatment options are available. They can be conservative or operative.[8,9] The goal of treatment is to achieve a painless fingertip with maximum functions and cosmetic results along with intact sensations.

Fingertip injuries are very common worldwide. There are many treatment modalities for fingertip injuries including conservative as well as various surgical techniques. This study was carried out to compare the results of conservative management versus skin grafting in FT injuries. So, that the patients are managed with the best treatment option with fewer side effects.

METHODOLOGY

This randomized controlled trial was conducted at Department of Orthopedic Surgery, Sharif Medical City Hospital (SMCH), Lahore. The study was approved by the ethical committee of the hospital. A total of 32 patients were included in this study by random sampling technique. There were total 38 injuries in all patients; this included 6 patients with two fingertip injuries. The patients with a history of diabetes mellitus, peripheral neuropathy and injuries with exposed bone were excluded from the study, whereas patients of both gender and age more than 18

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Farooq Azam Khan
Assistant Professor Department of Orthopaedic Surgery
Sharif Medical & Dental College
E-mail: dr.farooq224@hotmail.com

Received: May 5, 2018; Accepted: May 25, 2018.

years with fingertip injuries without bone exposure were included in this study. The detailed history of patients regarding the exact mechanism of injury, physical examination and radiographs were taken. All the patients were given analgesics, tetanus prophylaxis and antibiotics. Normal saline 0.9% was used for wound irrigation and further management was planned according to the patient's group. Based on the mode of treatment, patients were divided into two groups. Group I included 19 fingertip injuries which were managed conservatively with dressing only. Group II included 19 fingertip injuries which were managed by skin grafting. Proper follow-up was maintained for next six months. At the end of 3rd & 6th months, they were assessed for defected surface area, average healing time, cold intolerance, infection, hypersensitivity, two-point discrimination, joint stiffness and cosmetic appearance.

STATISTICAL ANALYSIS

The data was analyzed by using Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics were applied to calculate mean and standard deviation. Frequency distribution and percentages were calculated for study variables. A p-value less than 0.05 was considered statistically significant.

RESULTS

The mean age of the patients was 26±11 years ranging from 15-55 years. Twenty six patients (81.3%) were males and 6(18.7%) were females. In 22 patients (69%), the cause of injury was industrial accident whereas in 10 patients (31%), the cause of injury was domestic. Conservative management was used to treat 19 injured fingertips (group I) and the remaining 19 injured fingertips were treated using full-thickness skin graft (group II).

In group I patients, the mean healing time was 26 days. Two-point discrimination was measured at six month interval after injury comparing both hands. There was an average increase in the two-point discrimination distance from 1.90±0.27mm in the contralateral normal digit to 2.85±0.52 mm in the affected digit. Cold intolerance was reported in 6(32%) fingers after 3 months and in 1(5.2%) finger after 6 months. Hypersensitivity was not observed in any of the fingers. All the digits were freely mobile and no joint stiffness was observed in any finger. Cosmetic outcome was good in 14(74%) fingers.

On the other hand in group II patients with full thickness skin grafting, the healing time was 15 days. An average increase in the two-point discrimination distance from 2.06±0.33 mm in the contralateral normal digit to 6.56±0.66 mm in the affected digits was noted. Cold intolerance was detected in 9(47.3%) fingers after 3 months and only in 3(15.7%) fingers after 6 months. Hypersensitivity was noticed in 11(58%) fingers after 3 months, which later vanished after 6 months. Joint stiffness was noted in 7(36.8%) fingers. The good cosmetic outcome was observed in 4(21%) fingers (Table 1).

DISCUSSION

The human hand is susceptible to domestic and industrial trauma in which fingertip is particularly involved.[10] Fingertip reconstruction is a major problem in such cases as the treatment varies widely. There is a controversy regarding the management of fingertip amputations.[11] The aim of treatment of fingertip injuries is to restore a functional, painless finger with intact sensation and avoid complications. The complications of these injuries are the formation of neuromas, loss of sensation of digits and nail deformities.[12,13] There are different treatment options of fingertip injuries. A careful individualization is required in such cases. Small wounds without bone exposure can be managed conservatively using dressings. Wound healing by secondary intention occurs in such cases. However, for

Table 1: Comparison of study groups on the basis of mode of treatment

	Group I	Group II
Defected surface area	1.8 cm^2 (Range 0.5-2.3 cm^2)	1.6 cm^2 (range 0.5-2.0 cm^2)
Average healing time	26 days	15 days
Cold intolerance	6 fingers after 3 months 1 finger after 6 months	9 fingers after 3 months 3 fingers after 6 months
Infection	No	No
Hypersensitivity	No	11 fingers after 3 months None after 6 months
Two-point discrimination	2.85±0.52 mm	6.56±0.66 mm
Joint stiffness	No	7 fingers
Good cosmetic outcome	14 fingers	4 fingers

larger wounds and exposed bone, skin grafting is preferred because it provides faster healing.[14,15]

The results of our study showed that conservative management was better than skin grafting for FT injuries. Cold intolerance, hypersensitivity and joint stiffness were common in patients treated with skin grafting. Cosmetic outcome was good in patients treated conservatively with dressings. Similar results were seen in another study.[13] Skin grafting provides faster healing in FT injuries without bone exposure, especially in volarly directed wounds. The findings are consistent with another study in which the healing time by skin grafting is quite less than the conservative management. Few surgeons advise full-thickness grafting for better double coverage.[16,17] According to our results, the two-point discrimination test showed a greater increase in distance among the patients treated with skin grafting. This finding is supported by the previous literature.[18,19]

A study was conducted in Australia to evaluate conservative management of 15 fingertip injuries. After the initial wound care, the dressing was used for the management of injuries. The response of treatment was satisfactory in all patients except 1. Follow-up after 18-24 months revealed that 9 digits attained normal pulp thickness, 5 had decreased pulp thickness and 1 had increased thickness. Hypersensitivity was reported in 14 digits and numbness in 1 patient. They concluded that conservative management of fingertip injuries had good results.[20]

Various studies were conducted in the world regarding the conservative and surgical management of FT injuries. According to the study conducted in America, the healing time of fingertip injuries after conservative management was 4 weeks. However, it was 2 weeks for small wounds without bone exposure. Most patients were satisfied with the cosmetic outcome. The digits regained normal pulp thickness in the majority of the cases. Only one hundred nail deformities were reported out of 1,592 fingertip injuries.[21] In a study by Weichman et al. 4 out of 65 patients had decreased two-point discrimination. However, in another study, two-point discrimination was the same as that of uninjured hand ranging between 3 and 6 mm. Cold intolerance was reported in only a small number of cases and frequently resolved by 1 year. In the conservative treatment of FT injuries with dressings, there is no restriction of movement of hand and digits and no effect on grip strength.[22]

Surgical treatment is associated with stiffness and infection. In a study by Chow et al. stiffness and infection were reported in 8% and 17% cases of skin grafting for FT injuries.[23] According to Ma et al. infection was the cause of graft failure. The grip strength and fine motor activities were decreased in patients treated with surgical intervention.[21]

Our results showed that cold intolerance was reported mostly in the surgical treatment of fingertip injuries. Comparable results were seen in another study which showed that patients treated with the surgical interventions had cold intolerance in 24% cases and two-point discrimination was 5.6%.[21] Neuromas are also a common complication of the surgical management of FT injuries. They are uncommon in conservative management. According to a study, out of 94 patients who were surgically treated, 7% developed painful neuromas.[23]

A study was done by Weichman et al. for 100 fingertip injuries which showed that 64% patients healed with conservative management whereas only 18 % required surgical treatment. These 18% patients had larger defects with bone exposure.[22] The disadvantage of conservative management was the increased time of healing as compared to skin grafting. Similar results were found in another study conducted by Ma et al.[21]

CONCLUSION

In fingertip injuries without bone exposure, conservative management is better than surgical interventions. However, in larger defects with bone exposure, skin grafting should be considered.

REFERENCES

1. Cheung K, Hatchell A, Thoma A. Approach to traumatic hand injuries for primary care physicians. Can Fam Physician. 2013; 59(6):614-8.

2. Huisstede BM, Bierma-Zeinstra SM, Koes BW, Verhaar JA. Incidence and prevalence of upper-extremity musculoskeletal disorders: A systematic appraisal of the literature. BMC Musculoskelet Disord. 2006; 7:7.

3. Matsuzaki H, Narisawa H, Miwa H, Toishi S. Predicting functional recovery and return to work after mutilating hand injuries: usefulness of campbells hands injury severity score. J Hand Surg Am. 2009; 34(5):880-5.

4. Chang J, Vernadakis AJ, McClellan WT. Fingertip injuries. Clin Occup Environ Med. 2006; 5(2):413-22.

5. Yeo CJ, Sebastin SJ, Chong AK. Fingertip injuries. Singapore Med J. 2010; 51(1):78-86.

6. Ramirez EG, Hoyt KS. Management of hand injuries: Part II. Adv Emerg Nurs J. 2016; 38(4):266-78.

7. Damert HG, Altmann S. Treatment of fingertip amputations using semiocclusive dressing (German). Trauma Surgeon. 2012; 115:798-801.

8. Bickel KD, Dosanjh A. Fingertip reconstruction. J Hand Surg Am. 2008; 33(8):1417-9.

9. Carlsen BT, Moran SL. Thumb trauma: Bennett fractures, Rolando fractures and ulnar collateral ligament injuries. 2009; 34(5):945-52.

10. Evans DM, Bernadis C. A new classification for fingertip injuries. J Hand Surg Br. 2000; 25(1):58-60.

11. Panattoni JB, De Ona IR, Ahmed MM. Reconstruction of fingertip injuries: surgical tips and avoiding complications. J Hand Surg Am. 2015; 40(5):1016-24.

12. Raja SS, Venkatramani H, Bharathi R, Jayachandran S. Reconstruction of fingertip amputations with advancement flap and free nail bed graft. J Hand Surg Br. 2002; 27(2):134-8.

13. Donald HL, Megan EM, Samuel NC. Fingertip injuries: an update on management. JAAOS. 2013; 21(12):75666. doi: 10.5435/JAAOS-21-12-756.

14. Saraf S, Tiwari VK. Fingertip injuries. J Orthop. 2007 Apr-Jun; 41(2):163-8. doi: 10.4103/0019-5413.32051.

15. Mennen U, Wiese A. Fingertip injuries management with semi-occlusive dressing. J Hand Surg Br. 1993; 18(4): 416-22.

16. Elliot D, Moiemen NS. Composite graft replacement of digital tips: before 1850 and after 1950. J Hand Surg Br. 1997; 22(3):341-5.

17. Lai HT, Chen AD, Chang FS, Lai YW, Wang HM, Wu YC, et al. A new method for non-replantable fingertip amputation. Plast Reconstr Surg. 2015; 136(4):105-6.

18. Adani R. Heterodigital flaps for severe pulp defects. BMC. 2015; 9(3):60.

19. Matsuzaki H, Yoshizu T, Maki Y, Tsubokawa N. Functional and cosmetic results of fingertip replantation: anastomosing only the digital artery. Ann Plast Surg. 2004; 53(4):353-9.

20. Ha NB, Chang AC, Sullivan JS, Leonello DT. Non-operative management of fingertip injuries with an intravenous dressing. J Wound Care. 2015 Jun; 24(6):278-9. doi: 10.12968/jowc.2015.24.6.276.

21. Krauss EM, Lalonde DH. Secondary healing of fingertip amputations: a review. Hand (NY). 2014 Sep; 9(3):282-8. doi: 10.1007/s11552-014-9663-5.

22. Weichman KE, Wilson SC, Samra F, Reavey P, Sharma S, Haddock NT, et al. Treatment and outcomes of fingertip injuries at a large metropolitan public hospital. Plastic Reconstr Surg. 2013; 131:107-12.

23. Chow SP, Ho E. Open treatment of fingertip injuries in adults. J Hand Surg. 1982; 7:470-6.

Original Article

Study of Lipid Peroxidation Marker (MDA) and Vitamin C in Pregnancy-Induced Hypertension

Ghazal Mansoor, Rabia Sattar, Sana Qanber, Ejaz Ahmed, Hassan Shafique, Ayesha Zahid

ABSTRACT

Objective: To determine the levels of malondialdehyde (MDA) and vitamin C in hypertensive pregnant women as compared to normotensive pregnant women and non-pregnant control subjects.

Methodology: It was a cross-sectional descriptive study conducted at Sharif Medical City Hospital (SMCH). The study was approved by the ethical committee of the hospital. Eighty subjects (including 35 hypertensive pregnant women, 35 normotensive pregnant women and 10 non-pregnant control subjects) attending the Gynaecology OPD of SMCH were enrolled in the study. Consecutive sampling technique was used. Venous blood was collected, centrifuged and obtained serum was used for the estimation of malondialdehyde (MDA) and vitamin C.

Results: Malondialdehyde was significantly increased in pregnancy-induced hypertensive women when compared with the normotensive pregnant women and non-pregnant control subjects. On the other hand, the level of vitamin C was significantly reduced in pregnancy-induced hypertensive women as compared to other study subjects.

Conclusion: The levels of vitamin C are decreased in pregnancy-induced hypertension. So, vitamin C supplementation in the early weeks of gestation might decrease the oxidative damage and improve maternal and perinatal outcome.

Keywords: *Pregnancy-induced hypertension (PIH). Lipid peroxidation. Malondialdehyde. Vitamin C.*

INTRODUCTION

Pregnancy is confronted with many physiological and metabolic changes.[1,2] Pregnancy-induced hypertension (PIH) is a medical complication which occurs in 5-10% of the pregnancies.[3,4] The frequency of PIH among different hospitals, regions and countries is variable. Pregnancy-induced hypertension (PIH) is defined as hypertension which develops as a result of pregnancy in a previously normotensive woman and subsides after the delivery.[5] The major event leading to PIH is the reduced uteroplacental perfusion as a consequence of atypical cytotrophoblast invasion of spiral arterioles.[6] Placental ischemia is supposed to be the main cause of extensive activation/dysfunction of the maternal vascular endothelium.[7] This will results in the exaggerated production of endothelin & thromboxane and decreased production of vasodilators such as nitric oxide (NO) and prostacyclin.[8] These endothelial derangements cause hypertension. Lipid peroxidation occurs at low levels in all cells and tissues. In a healthy body, oxidation by free radicals and neutralization by antioxidants continue to be in balance. When the reactive oxygen species (ROS) are in great quantity, oxidative stress occurs which is considered to be the contributory factor in PIH.[9] Recently, the oxygen-derived free radicals have been reported to play a significant role in the pathogenesis of PIH.[10] In addition, it has been shown that a biochemical imbalance in PIH occurs with an increase of oxidative stress and lipid peroxidation and a lack of antioxidants.[11] Lipid peroxides, as a yield of a changed oxidative stress, are involved in endothelial cell damage, vasospasm and imbalance between thromboxane and prostacyclin. Malondialdehyde is an indicator of lipid peroxidation and oxidative stress. Non-enzymatic antioxidants such as vitamin C can neutralize free radicals.[12]

Pregnancy-induced hypertension is a common health problem in Pakistan. The study was conducted to evaluate the levels of vitamin C in pregnancy-induced hypertensive women. As there is increased oxidative stress in PIH, vitamin C supplementation may play a role in regression of hypertension.

METHODOLOGY

It was a cross-sectional descriptive study conducted at Sharif Medical City Hospital (SMCH). The study was approved by the ethical committee of the hospital. Eighty subjects were enrolled in the study including 35 hypertensive pregnant women, 35 normotensive pregnant women and 10 non-pregnant control subjects. Consecutive sampling technique was used. The blood samples were collected from the patients attending the antenatal OPD in Gynaecology Department of SMCH, Lahore. Informed consent and medical history of all patients were taken. Using aseptic measures, 3 ml blood sample was drawn by venipuncture and centrifuged to separate serum. Samples were kept in the freezer at -20ºC. Malondialdehyde and vitamin C levels were

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr Ghazal Mansoor
Associate Professor Department of Physiology
Sharif Medical and Dental College, Lahore,
Email: ghazalmajeed100@gmail.com

Received: April 5, 2018; Accepted: May 29, 2018.

measured in the study subjects by the spectrophotometric method and enzyme-linked immunosorbent assay (ELISA) respectively.

STATISTICAL ANALYSIS

The data was analyzed using Statistical Package for Social Sciences (SPSS) version 23 and expressed as the mean ± standard deviation. The study variables were analyzed by using Univariate Analysis of Variance (ANOVA).

RESULTS

The age of the study subjects was between 18-35 years. The study analyzed MDA and vitamin C in hypertensive pregnant women compared to normotensive pregnant women and non-pregnant controls. Malondialdehyde was found to be increased in normotensive pregnant women (1.571±0.146 nmol/ml) compared to non-pregnant healthy females (1.1990±0.102 nmol/ml). The levels further showed a significant increase in pregnancy-induced hypertensive subjects (3.704±0.138nmol/ml). These results are shown in figure 1. The levels of MDA were highest in the first trimester as compared to second and third trimesters in pregnancy-induced hypertensive patients (Table 1).

There was a significant decrease in vitamin C levels in normotensive pregnant females (0.490±0.020mg/g) as compared to controls (0.9172±0.430mg/g) and the levels were lowest in pregnancy-induced hypertensive patients (0.339±0.019mg/g). The levels of vitamin C were increased with progression of gestation from first to the third trimester in PIH but the rise was not significant (Table 2).

The results obtained were statistically significant. The present study showed a statistically significant increase in MDA and a fall in nonenzymatic antioxidant enzymes (vitamin C) reflecting increased oxidative stress in pregnancy. Hypertensive women showed an imbalance between the pro-oxidants and nonenzymatic antioxidants as compared to the healthy pregnant women.

DISCUSSION

During normal physiological processes, reactive

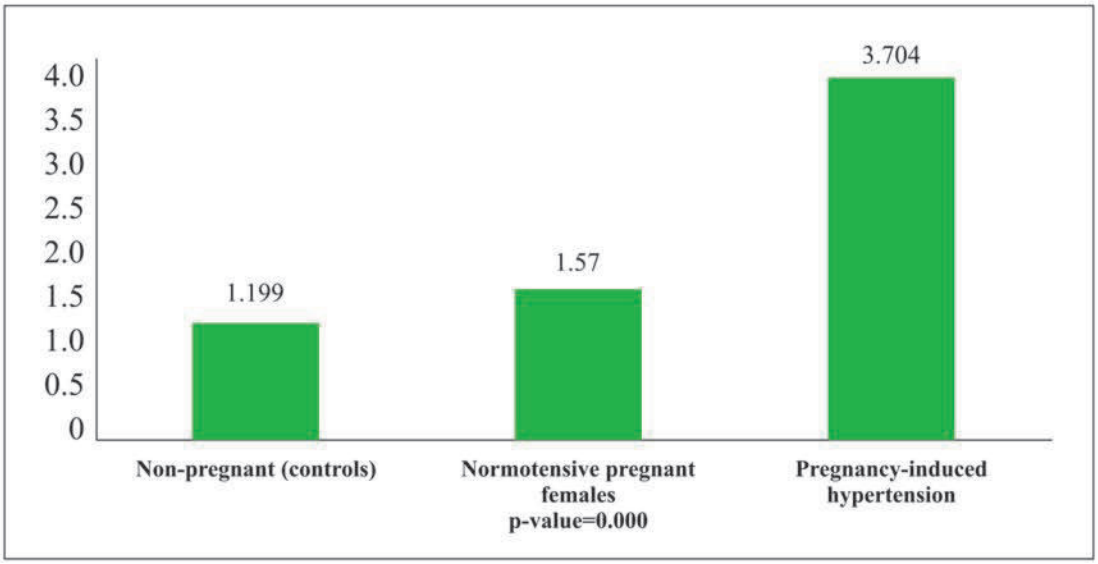


Figure 1: Levels of MDA (nmol/ml) in study subjects

Table 1: Comparison of MDA levels in trimesters in PIH

Trimester	Mean±SD	p-value
1st	2.883±0.205	0.235
2nd	2.548±0.191	
3rd	2.481±0.114	

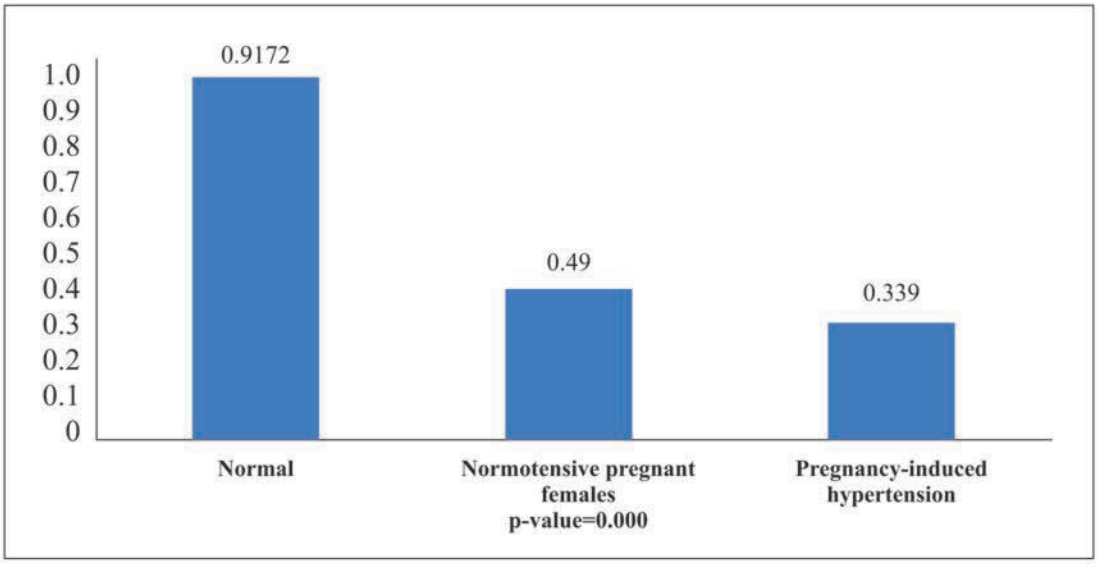


Figure 2: Levels of vitamin C (mg/g) in study subjects

Table 2: Comparison of vitamin C levels in trimesters in PIH

Trimester	Mean±SD	
1st	0.398±0.028	p-value 0.585
2nd	0.416±0.026	
3rd	0.430±0.016	

oxygen species (ROS) are continuously produced and they are removed by antioxidant defense mechanisms.[16] In pathological conditions, there is an imbalance resulting in lipid peroxidation and oxidative damage.[17] Oxidative stress is an important factor in the pathogenesis of pregnancy-induced hypertension.[18] Pregnancy-induced hypertension is a condition of pregnancy in which antioxidant defenses system fail and tissues are injured.[19] In our study, the lipid peroxidation stress marker i.e. malondialdehyde (MDA) levels were increased significantly in the serum of the patients with pregnancy-induced hypertension.[13] The rise in MDA could be due to oxidative damage and increased production of reactive oxygen species in these patients. The lipid peroxides and free radicals may be an important causative factor in the pathophysiology of PIH.[14] The current study shows a significant decrease in the levels of vitamin C (nonenzymatic antioxidant defense system) in patients with PIH when compared to controls. There was a significant fall in vitamin C levels in normal pregnancy (0.490 ± 0.020) as compared to controls (0.9172 ± 0.430) with a further decrease in levels in pregnancy-induced hypertensive patients (0.339±0.019) as compared to normal pregnant women. The results obtained were statistically significant. Vitamin C, a water-soluble antioxidant, was reported to act as the first-line antioxidant defense against free oxygen radicals present primarily in the serum.[15]

The results were consistent with the study of Sharma et al. in India in which the blood levels of oxidative stress markers (glutathione peroxidase (GPX), superoxide dismutase (SOD) and malondialdehyde (MDA) and antioxidants (vitamin C and lycopene) were measured. Fifty pregnant hypertensive women and 50 normotensive pregnant women were included in the study. The oxidative stress markers were markedly raised and the antioxidant levels were decreased in women with PIH as compared to normotensive pregnant study subjects.[15]

Mohanty et al. revealed in their study that in hypertensive disorders of pregnancy there is an imbalance between lipid peroxidation and antioxidant vitamin status because of oxidative stress. The decreased serum concentration of the antioxidant vitamin C supports the hypothesis that lipid peroxidation is an important causative factor in the pathogenesis of the hypertensive disorder. They found that serums MDA were raised while serum vitamin C were markedly decreased in these patients.[20]

A study conducted by Ghate et al. found that hormonal and metabolic changes in pregnancy predispose to oxidative stress. They measured the levels of MDA and vitamin C in 60 pregnant females and 20 controls. According to them, levels of MDA increases and vitamin C level decreases with gestational age in pregnant females as compared to control group. In pregnancy, excessive oxidative stress in the body increases and ascorbic acid defense system help in combating the oxidative stress.[21]

Studies have been done to assess the therapeutic effect of vitamin C in pregnancy-induced hypertensive women. Agudelo et al. determined whether supplementation of vitamin C given during pregnancy reduces the incidence of PIH. He concluded that there was no significant difference with supplementation of vitamin C.[22] However, another study also assessed the effect of vitamin C in PIH. A significant increase in the levels of lipid peroxidation occurs in these women. Vitamin C supplementation resulted in the reduction in the levels of malondialdehyde.[23]

CONCLUSION

The levels of vitamin C are decreased in pregnancy-induced hypertension. So, vitamin C supplementation in the early weeks of gestation might decrease the oxidative damage and improve maternal and perinatal outcome.

REFERENCES

1. Bilodeau JF, Hubel CA. Current concepts in the use of antioxidants for the treatment of preeclampsia. J Obstet Gynaecol Can. 2003 Sep 1; 25(9):742-50.

2. Bhattacharya S, Campbell DM. The incidence of severe complications of preeclampsia. Hypertens Pregnancy. 2005 Jan 1; 24(2):181-90.

3. Brichant G, Dewandre PY, Foidart JM, Brichant JF. Management of severe preeclampsia. Acta Clinica Belgica. 2010 Jun 1; 65(3):163-9.

4. Chhabra S, Kakani A. Maternal mortality due to eclamptic and non-eclamptic hypertensive disorders: a challenge. Journal of obstetrics and gynaecology. 2007 Jan 1; 27(1):25-9.

5. Duley L. The global impact of pre-eclampsia and eclampsia. Semin Perinatol. 2009 Jun; 33(3):130-7.

6. Khumanthem PD, Chanam MS, Samjetshabam RD. Maternal mortality and its causes in a tertiary center. J Obstet Gynaecol India. 2012 Apr 1; 62(2):168-71.

7. Klungsoyr K, Morken NH, Irgens L, Vollset SE, Skjaerven R. Secular trends in the epidemiology of preeclampsia throughout 40 years in Norway: prevalence, risk factors and perinatal survival. Paediatr Perinat Epidemiol. 2012 May 1; 26(3):190-8.

8. Matsuda Y, Hayashi K, Shiozaki A, Kawamichi Y, Satoh S, Saito S. Comparison of risk factors for placental abruption and placenta previa: case-cohort study. J Obstet Gynaecol Res. 2011 Jun 1; 37(6):538-46.

9. Rattray DD, O' Connell CM, Baskett TF. Acute disseminated intravascular coagulation in obstetrics: a tertiary centre population review (1980 to 2009). J Obstet Gynaecol Can. 2012 Apr 1; 34(4):341-7.

10. Savitz DA, Danilack VA, Engel SM, Elston B, Lipkind HS. Descriptive epidemiology of chronic hypertension, gestational hypertension, and preeclampsia in New York State, 1995–2004. Matern Child Health J. 2014 May 1; 18(4):829-38.

11. Schneider S, Freerksen N, Maul H, Roehrig S, Fischer B, Hoeft B. Risk groups and maternal-neonatal complications of preeclampsia–current results from the national German Perinatal Quality Registry. Journal of perinatal medicine. 2011 May 1; 39(3):257-65.

12. Liu CM, Chang SD, Cheng PJ. Relationship between prenatal care and maternal complications in women with preeclampsia: implications for continuity and discontinuity of prenatal care. Taiwanese Journal of Obstetrics and Gynecology. 2012 Dec 1; 51(4):576-82.

13. Mitka M. Any hypertension during pregnancy raises risk for several chronic diseases. JAMA. 2013 Mar 13; 309(10):971-2.

14. Mannisto T, Mendola P, Vaarasmaki M, Jarvelin MR, Hartikainen AL, Pouta A, et al. Elevated blood pressure in pregnancy and subsequent chronic disease risk clinical perspective. Circulation. 2013 Feb 12; 127(6):681-90.

15. Sharma JB, Sharma A, Bahadur A, Vimala N, Satyam A, Mittal S. Oxidative stress markers and antioxidant levels in normal pregnancy and preeclampsia. International Journal of Gynecology & Obstetrics. 2006 Jul 1; 94(1):23-7.

16. Wilson BJ, Watson MS, Prescott GJ, Sunderland S, Campbell DM, Hannaford P, et al. Hypertensive diseases of pregnancy and risk of hypertension and stroke in later life: results from cohort study. BMJ. 2003 Apr 19; 326(7394):845.

17. Feig DS, Shah BR, Lipscombe LL, Wu CF, Ray JG, Lowe J, et al. Preeclampsia as a risk factor for diabetes: a population-based cohort study. PLoS medicine. 2013 Apr 16; 10(4):e1001425.

18. Tuovinen S, Eriksson JG, Kajantie E, Lahti J, Pesonen AK, Heinonen K, et al. Maternal hypertensive disorders in pregnancy and self-reported cognitive impairment of the offspring 70 years later: the Helsinki Birth Cohort Study. Am J Obstet Gynecol. 2013 Mar 1; 208(3):200.e1-9.

19. Young IS, Woodside JV. Antioxidants in health and disease. J Clin Pathol. 2001; 54:176-86.

20. Mohanty S, Sahu PK, Mandal MK, Mohapatra PC, Panda A. Evaluation of oxidative stress in pregnancy induced hypertension. IJCB. 2006; 21(1):101-5.

21. Ghate J, Choudhari AR, Ghugare B, Singh Ramji. Antioxidant role of vitamin C in normal pregnancy. Biomedical Research. 2011; 22 (1):49-51.

22. Agudelo AC, Romer R, Kusanovic JP, Hassan S. Supplementation with vitamin C and E during pregnancy for the prevention of preeclampsia and other adverse maternal and perinatal outcomes : a systematic review and meta-analysis. Am J Obstet Gynecol. 2011; 204(6): 5031-42.

23. Olayaki, Uotila JT, Tuimala RJ, Aarnio TM. Findings on lipid peroxidation and antioxidant function in hypertensive complications of pregnancy. Br J Obstet Gynecol. 1993; 100:270-6.

Original Article

Utilization of Contraceptive Services by Females Visiting Reproductive Health Center at Sharif Medical City Hospital

Samina Khalid, Shaista Mehmood, Shawana Saeed, Qurat-ul-Ain Asif, Sehar Fayyaz, Laila Afzal, Muhammad Shahid Iqbal

ABSTRACT

Objective: To assess the utilization of contraceptive services by females visiting Reproductive Health Center, Sharif Medical City Hospital (SMCH), Lahore.

Methodology: It was a cross-sectional descriptive epidemiological study which included 150 females attending the Reproductive Health Centre of SMCH over a period of one month. Convenient non-probability sampling technique was used. The study was approved by the ethical committee of the hospital. The data was collected through a questionnaire which was analyzed by using SPSS 23.

Results: Most of the women were educated housewives (87.3%) while 12.7% were employed. Majority of the women (53.2%) received information about family planning from health professionals and 90.7% women were aware of different family planning methods. Eighty one (54%) respondents were using different contraceptive methods. Sixteen percent were using oral contraceptive pills, 16% were using intrauterine contraceptive devices (IUCDs), 11.1% were on injectable contraceptives, 19.8% had tubal ligation, 29.7% and 6.2% of the respondents husbands were using condoms and withdrawal methods and1.2% respondents husbands were operated for the vasectomy.

Conclusion: The use of contraceptives is not based on knowledge and awareness. Nearly 90.7% of the women had family planning knowledge. The frequency of contraceptive use is comparatively low in our setup despite high levels of awareness. Illiteracy, poor contraceptive delivery system, the desire of male child, pressure from husband, extended family system and fear of side effects are the main factors responsible for low usage of contraception.

Keywords: *Family planning. Contraception. Reproductive Health Center.*

INTRODUCTION

According to World Health Organization (WHO), reproductive health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, to accomplish the process of reproduction throughout the reproductive life. Reproductive health, therefore, implies that people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so.[1]

Comprehensive reproductive health care comprises of counseling, information, education, communication and clinical services in family planning. Four pillars of safe motherhood include antenatal care, natal care, postnatal care and essential obstetric care along with this abortion care as allowed by law, prevention and treatment of sexually transmitted diseases (including HIV/AIDS), prevention and management of sexual violence and reproductive health programmes for adolescents.[2]

The expert committee (1971) of WHO defined family planning as a way of thinking and living that is adopted voluntarily upon the basis of knowledge, attitude and responsible decisions by individuals and couples, in order to promote health and welfare of the family group and thus contributes effectively to the social development of the country.[3]

Nearly one-fifth of the total burden of world's illnesses and premature deaths are due to lapse in family planning and sexual healthcare.[4] The majority of the women are using contraceptives. In 2015, 64% of the women were using some form of contraceptive worldwide. However, contraceptive use for family planning was lower (40%) in poorly developing countries as compared to developed countries. Globally in 2015 unmet need for family planning was 12% for women. The level was quite higher (22%) in the poorly developing countries.[5] In Pakistan, 50.6% of the women and 47.2% of the men are of reproductive age and the average fertility rate stands at 3.8 children per married couple.[6]

According to United Nations, use of contraception among Pakistani population is 38.5%.[7] Pakistan Demographic and Health Survey data (2012-2013) has revealed that currently, the contraceptive use is 35% in Pakistan. In rural areas, it is 24% which is considered to be too low, reflecting around 0.5% annual increase since the start of family planning programs in 1964.[8]

The magnitude of unplanned pregnancies and abortions is very high among young women, especially in the developing countries. There are 3 principal behavioral factors that significantly influence the use of a

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Muhammad Shahid Iqbal
Professor Department of Community Medicine
Sharif Medical & Dental College
E-mail: shahid.iqbal@sharifmedicalcity.org

Received: April 16, 2018; Accepted: June 5, 2018.

contraceptive measures i.e. authorizing a woman to make an independent decision, the ease of correspondence with her healthcare professional regarding contraceptive use and the cultural taboos about the contraceptive use.[7] Globally nearly 215 million women have a desire to avoid unwanted pregnancies but are unable to do so because of lack of access to contraceptive use.[9]

Pakistan is facing many hurdles to increase the contraceptive use across the country and especially in faraway rural areas. The fertility rates are high due to illiteracy, low status of women, high infant mortality, low level of education, desire for male children and misinterpretation of religion. Despite the fertility rates being high, the family planning services are poor in Pakistan and the contraceptive usage rates are less. This contributes to the greatest proportion of the world's infant and maternal mortality rate. Reducing growth population has been a prime focus of Pakistan's government five-year plan.[10,11] Therefore in the light of above- mentioned factors, it was imperative to conduct this study at SMCH.

METHODOLOGY

It was a cross-sectional descriptive epidemiological study conducted at Sharif Medical City Hospital, Lahore after getting approval from the hospital ethical committee. The study population included 150 females attending the Reproductive Health Centre at Sharif Medical City Hospital, Lahore over a period of one month. Convenient non-probability sampling technique was used. A semi-structured questionnaire was prepared and finalized after pretesting for interviews.

STATISTICAL ANALYSIS

The data collected through a questionnaire was entered and analyzed using Statistical Package for Social Sciences (SPSS) version 23. Chi-square test was applied where applicable. A p-value of ≤0.05 was used as cutoff level for significance testing.

RESULTS

Among 150 females visiting Reproductive Health Center, the majority (54.7%) were 20-30 years of age. Only 34(22.7%) females were illiterate while 116(77.3%) were educated. Only 12.7% of females were employed while rest (87.3%) of them were housewives. Regarding the educational status of the respondents husbands, 17.3% were illiterate while 82.7% were literate with different levels of education. Out of 150 respondents, only 14.7% had the family income of less than 10,000 rupees while 85.3% had family income more than 10,000 rupees. Eighty one females (54%) were living in the nuclear family while the remaining 69(46%) were part of an extended family (Table 1).

Out of 150 respondents, only 93(62%) were counseled

Table 1: Frequency distribution of study subjects according to socio-demographic characteristics

Socio-demographic characteristics	Frequency	Percentage (%)
Age of respondents		
<20 years	08	5.3
20-30 years	82	54.7
>30 years	60	40
Educational status of respondents		
Illiterate	34	22.7
literate	116	77.3
Occupation of respondents		
Housewives	118	78.7
Employed	19	12.7
Both	13	8.6
Educational status of respondents spouse		
Illiterate	26	17.3
Literate	124	82.7
Monthly household income		
<10,000	22	14.7
10,000-20,000	47	31.3
>20,000	81	54.0
Type of family		
Nuclear	81	54
Extended	69	46

about contraception during pregnancy. More than half of the respondents (53.2%) were counseled by doctors. The majority (90.7%) had awareness about different contraceptives methods. Among 150 respondents, 112(74.6 %) said that they had a family planning center in their area. Eighty one (54%) respondents were using different contraceptive methods. Sixteen percent were using oral contraceptive pills, 16% were using intrauterine contraceptive devices (IUCDs), 11.1% were on injectable contraceptives, 19.8% had tubal ligation, 29.7% and 6.2% of the respondents husbands were using condoms and withdrawal methods and1.2% respondents husbands were operated for the vasectomy. (Table 2).

The relationship between various respondents characteristics like education status and access to family planning center, knowledge about contraceptives and having counseling about contraceptives showed significant association with utilization of contraceptives (p-value < 0.05) (Table 3).

Table 2: Frequency distribution of respondents by their utilization of contraceptive services

Counseling about contraceptives during pregnancy	Frequency	Percentage (%)
Yes	94	62.7
No	56	37
Source of counseling about contraception		
Doctor	50	53.2
Lady Health Worker	19	20.2
Lady Health Visitor	25	26.6
Awareness about different contraceptive methods		
Yes	136	90.7
No	14	9.3
Access to family planning centers		
Yes	112	74.6
No	38	25.4
Respondents practicing contraceptive methods		
Yes	81	54
No	69	46
If yes, which contraceptive method? (n=81)		
Oral contraceptive pills	13	16
Condoms	24	29.7
Withdrawal method	5	6.2
Tubal ligation	16	19.8
Vasectomy	1	1.2
IUCDs	13	16
Injections	9	11.1

Table 3: Association between respondents different characteristics and utilization of contraceptives

Respondents characteristics	Utilized	Not utilized	p-value
Education status	116	34	<0.05
Access to family planning center	112	38	<0.05
Awareness about different contraceptive methods	136	14	<0.05
Counseling about contraceptives during pregnancy	94	56	<0.05

DISCUSSION

In the present study, more than half (60%) of the women were up to 30 years old while 40% were more than 30 years old. A similar study carried out by Mustafa and coworkers showed that 61% women were up to 30 years old while 39% were more than 30 years old.[12]

As far as the educational level of women is concerned, 22.7% were illiterate, 10.6% studied till primary school, 10.1% studied till middle school, 18% studied till matric, 6.1% completed their F.Sc., 24.5% did graduation and 8% of women were postgraduate. The findings of our study are in contrary with the study undertaken by Aamir et al. who reported that 75% of the women were illiterate, 8.6% studied till primary, 10% had secondary education and 6.4% studied till intermediate.[13] Therefore, the literacy level among the women emphasizes the need for education as a key component to combat overpopulation which will encourage the use of contraceptives.

The results of our study showed that 87.3% of the respondent women were housewives. This is similar to the findings of the study conducted by Zaman and teammates.[14] Study disclosed that majority of the study population had the total family income of more than 20,000 rupees (85.3%) while only 14.7% of the families had the monthly income of less than 10,000 rupees. The results of the study conducted by Kazi are worse than our study results which elucidated that 92% of the families had monthly income less than 10,000.[15]

Health personnel was the major source of giving information to most (90%) of our respondents. This finding matched to the results of another study which showed that the health personnel was the main source of information. On the contrary schools, friends, relatives or media were information givers reported by other authors. Therefore, the major role is played by primary healthcare providers in improving the women's knowledge and awareness of different contraceptive methods along with their advantages and disadvantages. In this regard, knowledge and skill of primary healthcare provider must be continuously enhanced and reinforced to deliver the right and sound advice about contraceptive.[16,17]

The study identified that among the various contraceptive methods used by respondents, 29.7% were using condoms, 19.8% had the tubal ligation, 16% were using pills for birth control and 11.1% were in favor of injections while the remaining were using some other form of contraception. In contrast, Omo-Aghoja et al. mentioned that most commonly used contraceptive methods were injectables, condoms, progestin-only pills and oral contraceptive pills by the women of Amukpe Community, Nigeria.[17] We can assess that due to poor education and socioeconomic level, cultural and religious beliefs, modern contraceptives are probably unavailable, inaccessible or unaffordable. In our setting, we need studies targeting the cost-benefit and acceptance of each of the contraceptive methods should be done to address the right message during academic sessions. The focus is on the advantages of modern contraceptive methods to promote them and increase their use.

To measure attitude is really difficult because it is expressed in a vague way. It is astonishing that most of the respondents showed a positive attitude. Eighty percent of respondents considered family planning for the health of the mother and their children. Similarly, a study carried out by Mustafa and co-workers showed that almost 90% showed a positive attitude towards family planning.[12] The gap between awareness and practices are seen to be prevalent for different reasons where people have awareness but are reluctant to practice.

CONCLUSION

Our study depicts that knowledge and awareness do not always lead to the use of contraceptives. The majority of the women have knowledge about family planning but most of them do not apply contraceptive methods due to illiteracy, poor contraceptive delivery system, the desire of male child, pressure from husband, extended family system and fear of side effects of contraception. This can be decreased by proper selection of contraception before starting its use and adequate follow-up of women using contraception by the planning services. Women's educational level must be increased to make the family planning campaigns a real success.

RECOMMENDATIONS

- It is recommended to emphasize on female education regarding contraceptive methods.
- Awareness must be created through media campaigns. Television is a strong medium which should be used to convey the message of the importance of family planning to both men and women.
- Men should be encouraged to play a positive role in the promotion of family planning methods.
- Adequate training should be provided at the grass root level workers for improving their knowledge of family planning methods.
- Providing contraception to help women and men plan and space births, prevent unintended pregnancies and reduce the number of abortions.

REFERENCES

1. World Health Organization (WHO). Reproductive health. 2006. Available at: http://www.who.int/topics/reproductive_health/en.

2. World Health Organization (WHO). Reproductive Health Indicators. 2006. Available at: http:/www.apps.who.int/iris/bitstream/10665/43185/1/924156315X_eng.pdf.

3. Shweta, Singh MB. Knowledge and pattern of family planning adoption in Kasha Vidyapeeth Block, Varanasi District. Indian J Prev Soc Med. 2010; 41(12):21-7.

4. Mubarik M, Jameel N, Khalil R. Knowledge, attitude and utilization of sub-dermal birth control implants among married rural women of Pakistan. Int J Res Med Sci. 2016 Jun; 4(6):2229-39.

5. Kumar N. Met and unmet needs for family planning: a global issue. EC Gynaecology. 2016; 3(3):281-9.

6. Marie Stopes Society. Unmet need for family planning and reproductive health services in Pakistan. July 2015. Available at: http.//www.mariestopespk.org/wp-content/uploads/Choices-July-2015-Resize.pdf

7. Budhwani H, Anderson J, Herald KR. Muslim women's use of contraception in the United States. Reprod Health. 2018; 15:1.

8. National Institute of Population Studies (NIPS) and ICF International Pakistan demographic and health survey 2012-2013. 2012. Available at: http://www.nips.org.pk.

9. Ali SA, Fatmi Z. Predictors of modern contraceptive usage among women in rural Pakistan: physical access to services stills a major barrier. EC Gynecology. 2017; 4(1):24-33.

10. Marvi K, Howard N. Objects of temporary contraception: an exploratory study of women's perspectives in Karachi, Pakistan. BMJ. 2013; 3:e003279. doi: 10.1136/bmjopen-2013-003279.

11. Hamid S, Stephenson R. Provider and health facility influences on contraceptive adoption in urban Pakistan. Inter Fam Plan Perspect. 2006; 32(2):71-8.

12. Mustafa R, Afreen U, Hashmi HA. Contraceptive knowledge, attitude and practice among rural women. J Coll Physicians Surg Pak. 2008; 18(9):542-5.

13. Aamir F, Sheena. Assessment of knowledge, practices and barriers in family planning services in Korangi industrial area Karachi. Pakistan J Surg. 2014; 30(4):327-30.

14. Zaman M, Jabeen M, Wazir F. Choice of contraceptive methods among females attending family planning centre in Hayat Abad Medical Complex, Peshawar. J Pak Med Assoc. 2012; 62:564-72.

15. Kazi K. A study of knowledge , attitude and practice of family planning among women of rural Karachi. J Pak Med Assoc. 2004; 54:461-4.

16. Ghazal-Aswad S, Rizk DE, Al-Khoori SM, Shaheen H, Thomas L. Knowledge and practice of contraception in United Arab Emirates women. J Fam Plann and Reprod Health Care. 2001; 27(4):212-6.

17. Omo-Aghoja LO, Omo-Aghoja CO, Okonofua FE, Aghedo O, Umueri C. Factors associated with the knowledge, practice and perceptions of contraception in rural southern Nigeria. Ghana Med J. 2009; 43(3):115-21.

Original Article

Pattern of Tooth Loss in Patients with Partial Edentulism

Uzma Awan, Hamna Khawaja, Raheela Yasmeen, Sajjad Ahmed

ABSTRACT

Objective: To determine the prevalence and pattern of partial edentulism among dental patients attending the Dental OPD, Sharif Medical & Dental College, Lahore.

Methodology: It was a cross-sectional epidemiological survey conducted at Dental OPD, Sharif Medical & Dental College (SMDC), Lahore. The study was approved by the ethical committee of the hospital. Two hundred and forty eight patients were enrolled in the study by consecutive sampling technique. Data was collected by intraoral examination of the patients for missing teeth. The frequencies of missing teeth were measured by gender and location in the arch. The causes of tooth loss were documented according to the history given by the patients. The data was analyzed using the SPSS version 22.

Results: The results of this study reveal that the incidence of partial edentulism in the maxillary and mandibular arches was 54% in Kennedy's class III, 25.9% in class II, 11.2% in class I and 8.9% in class IV. Dental caries was the most common reason for tooth loss in class I, II and III whereas in class IV, trauma was the most common cause.

Conclusion: Edentulism is more prevalent in mandibular arches. Kennedy's class III dental arch is the most common pattern both in the maxillary and mandibular arches. Dental caries is the most common reason of tooth loss.

Keywords: *Partial edentulism. Kennedy's class. Dental caries.*

INTRODUCTION

Edentulous state means the tooth loss which is a gap in the dental arch normally occupied by one tooth or more. Edentulism could be partial or complete. A person may lack a few teeth (partially edentulous) or all the teeth in one or both maxillary and mandibular jaws (completely edentulous) for various reasons.[1] The tooth loss or edentulism leads to inability to chew and improper food digestion. It has serious social, physiological, psychological and emotional concerns impacting the quality of life and self-esteem.[2]

The prevalence of edentulism has decreased in many countries in last decades due to improvement in the oral health measures of the population.[3-6] The recent trends in clinical dentistry favours preservation of natural dentition with a consequent decrease in edentulous patients.[7-9] The partial edentulism has been observed in all ages. The main causes of tooth loss are dental caries, periodontal disease and trauma.[1]

Many classifications have been proposed and used to identify the possible combinations of available teeth to ridges for partially edentulous arches. The Kennedy's classification is the most widely accepted classification for partially edentulous arches. The essential features of Kennedy's classification are instant visualization, type of the support for prosthesis and evaluation of removable partial denture design features.[10,11]

There are several problems associated with partial edentulism which may lead to clinically challenging situations and compromised conditions. The complications observed in partial edentulism could be the drifting and tilting of adjacent teeth, supra-eruption of opposing teeth, speech difficulties, compromised facial appearance and temporomandibular joint disorders.[3,4,9] Additionally, the damage and continuing degradation of the alveolar bone, the adjacent teeth and the supporting structures will affect the effort to achieve a suitable restoration in a partially edentulous patient.[12] The dietary options are limited in the patients with partial edentulism which is associated with health issues like weight loss. It also leads to lack of confidence, psychological issues and negatively affects the quality of the life of an individual.[3]

The incidence of the various Kennedy's classes of removable partial dentures in a population should be revised regularly.[9] It is essential to document the prevalence and pattern of partial edentulism to find the prosthodontics requirements of the study population. It will also be helpful to provide guidelines for educational planning for the upcoming practitioners of the community. The evidence developed from such type of study will facilitate the community dentistry workers for the designing of the preventive measures appropriate for that particular community.[9,12,13]

METHODOLOGY

It was a cross-sectional epidemiological survey carried out from January to March 2018 in the dental outpatient department of SMDC, Lahore. The study was approved by the ethical committee of the hospital. Two hundred

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Uzma Awan
Associate Professor Department of Prosthodontics
Sharif Medical & Dental College
E-mail: uzmashahid112@gmail.com

Received: May 1, 2018; Accepted: June 10, 2018.

and forty eight patients were enrolled in the study by consecutive sampling technique. Data was collected by intraoral examination of the patients for missing teeth. The frequencies of missing teeth were measured by gender and location in the arch. The causes of tooth loss were documented according to the history given by the patients. All adult patients with permanent dentition and partially edentulous were included. Patients with wisdom tooth loss, teeth removed for orthodontic treatment and impacted 3rd molar were excluded from the study.

STATISTICAL ANALYSIS

The data analysis was done using Statistical Package for Social Sciences (SPSS) version 22. Frequencies and percentages were calculated for the study variables. A p-value of 0.05 was considered significant.

RESULTS

The age range of study population was 14-66 years. One hundred thirty two (53.2%) patients were females and 116(46.8%) were males. Patients with partial edentulism in both maxillary and mandibular arches were 100(100x2=200). The rest of the 148 patients had partial edentulism in only one arch. So, the total number of edentulous arches was 348. Partial edentulism was more common in the mandibular arch as compared to maxillary arch. Out of 148 cases, 42 patients were with only one missing tooth and the commonly missing tooth was the mandibular 1st molar. Kennedy's class III was the most common (54%) pattern in both the maxillary and mandibular arches followed by class 11(25.9%). These results are shown in table 1.

According to the patient's history, the most common cause of tooth loss was dental caries (67.3%). The second most common cause was the periodontal disease (17.3%). Both periodontal disease & dental caries was reported in 6.9% and trauma in 8.5% of cases. Dental caries was the most common cause in Kennedy's class I, II and III whereas in class IV, trauma was the most common cause.

DISCUSSION

Edentulism is a common manifestation of patients attending the dental departments. It has a major impact on health and quality of life. The Kennedy classification for removable partial dentures (RPDs) is used in the current study for its simplicity of the interpretation and it is widely accepted.[11] In the present study, the prevalence and pattern of partial edentulism was seen among dental patients attending the dental OPD. It was revealed that the partial edentulism in the

Table 1: Distribution of patients according to Kennedy's classification

Kennedy's class	Maxillary arches	Mandibular arches	Total arches (Percentage)
Class I	16	23	39(11.2%)
Class II	38	52	90(25.9%)
Class III	79	109	188(54%)
Class IV	21	10	31(8.9%)
Total arches	154	194	348 (100%)

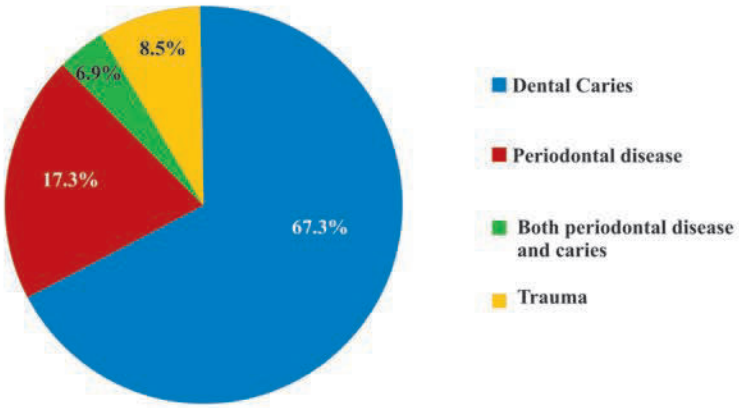


Figure 1: Causes of tooth loss in patients

mandibular arch was higher than the partial maxillary edentulism. Similar results has also been reported in other studies.[12,14]

The study showed that the most common reason of edentulism was the dental caries. The second most common reason was periodontal disease. Bruce also reported the dental caries as the most common cause of edentulism (83%) and periodontal disease in 17% of cases.[1] According to a study conducted in Nigeria, the periodontal disease and dental caries accounted for 46.5% and 43.9% cases of tooth loss respectively. Other causes of tooth loss were trauma (4.5%), tooth impaction (2.5%) and orthodontic problem (1.6%).[15]

The Kennedy's class III pattern was found to be the most common pattern of partial edentulism in the maxillary and mandibular arches (54%). The Class II was the second predominant pattern and was observed in 90(25.9%) patients. The class 1 pattern was seen in 39(11.2%) patients. The class IV pattern was reported in 31(8.9 %) cases. It was observed that Kennedy's class I, ll and lll patterns were more common in mandibular arches and class IV was common in maxillary arches. The most common cause of tooth loss in class IV was trauma. Out of 21 cases of trauma, 18 reported trauma in the maxillary anterior teeth. The main cause of trauma is the due to increase in road accidents, sporting activities and clashes with others of the same age group. The traffic accidents are the most common and physical fights, sporting injuries are the other causes of anterior dental trauma.[16]

Comparable results were found in a study carried out in India. The study sample was 1420 partially dentate arches. Kennedy's class III was the most common pattern (62%). Class I, II and III were present in 18%, 11% and 9% cases respectively.[11] Another study was conducted at Lahore Medical and Dental College in which 367 study participants were included. Kennedy's class III was reported in 44.4% and 49% of the maxillary and mandibular arches.[17] Our study results are also in accordance to the study of Madhankumar et al. He reported class III in 54.4% of the maxillary arches and 47.2% of the mandibular arches.[3] According to a study done in San Francisco, Kennedy's class III was only common in the maxillary arches, whereas in the mandibular arches, Kennedy's class I was the most dominant pattern.[12] In contrast, Pun et al. studied the patterns of tooth loss in patients receiving removable partial dentures in Eastern Wisconsin. According to his study, Kennedy class I was the most common removable partial denture (38.4%).[18]

The results obtained from present study on the pattern and etiology of tooth loss are very important to provide the information to dental health professionals, to address the multiple factors implicated in tooth loss. It is also helpful to educate and motivate patients about importance of saving tooth. At the national level, such data may also propose that preventive strategies intended at minimizing the tooth loss required to be reinforced.

CONCLUSION

Edentulism is more prevalent in mandibular arches. Kennedy's class III dental arch is the most common pattern both in the maxillary and mandibular arches. Dental caries is the most common reason of tooth loss.

LIMITATIONS OF STUDY

- The literacy level and the socioeconomic status were not evaluated to identify the cause of tooth loss.
- Radiographs were not used to identify congenitally missing and impacted teeth.
- The small sample size limits this study, additional studies with larger sample size are recommended.

REFERENCES

1. Bruce I, Nyako EA, Adobo J. Dental service utilization at the Korle Bu Teaching Hospital. Afr Oral Health Sci J. 2001; 2:4.

2. Batista MJ, Rihs LB, Sousa ML. Risk indicators for tooth loss in adult workers. Braz Oral Res. 2012; 26(5):390-6.

3. Madhankumar S, Mohamed K, Natarajan S, Kumar VA, Athiban I, Padmanabhan TV. Prevalence of partial edentulousness among the patients reporting to the Department of Prosthodontics Sri Ramachandra University Chennai, India: An epidemiological study. J Pharm Bioallied Sci. 2015; 7(Suppl 2):S643-7.

4. Vadavadagi SV, Srinivasa H, Goutham GB, Hajira N, Lahari M, Reddy GT. Partial edentulism and its association with socio-demographic variables among subjects attending dental teaching institutions, India. J Int Oral Health. 2015; 7(2):60-3.

5. Mayunga GM, Lutula PS, Sekele IB, Bolenge I, Kumpanya N, Nyengele K. Impact of the edentulousness on the quality of life-related to the oral health of the Congolese. Odontostomatol Trop. 2015; 38:31-6.

6. Eustaquio-Raga MV, Montiel-Company JM, Almerich-Silla JM. Factors associated with edentulousness in an elderly population in Valencia

(Spain). Gac Sanit. 2013; 27:123-7.

7. Bertossi D, Rossetto A, Piubelli C, Rossini N, Zanotti G, Rodella LF, et al. Evaluation of quality of life in patients with total or partial edentulism treated with computer-assisted implantology. Minerva Stomatol. 2013; 62(8 Suppl 1):37-44.

8. Dolan TA, Gilbert GH, Duncan RP, Foerster U. Risk indicators of edentulism, partial tooth loss and prosthetic status among black and white middle-aged and older adults. Community Dent Oral Epidemiol. 2001; 29:329-40.

9. Sadig WM, Idowu AT. Removable partial denture design: A study of a selected population in Saudi Arabia. J Contemp Dent Pract. 2002; 3:40-53.

10. McGarry TJ, Nimmo A, Skiba JF, Ahlstrom RH, Smith CR, Koumjian JH, et al. Classification system for partial edentulism. J Prosthodont. 2002; 11:181-93.

11. Bharathi M, Babu KR, Reddy G, Gupta N, Misuriya A, Vinod V. Partial edentulism based on Kennedy's classification: an epidemiological study. J Contemp Dent Pract. 2014; 15:229-31.

12. Curtis DA, Curtis TA, Wagnild GW, Finzen FC. Incidence of various classes of removable partial dentures. J Prosthet Dent. 1992; 67:664-7.

13. Esan TA, Olusile AO, Akeredolu PA, Esan AO. Sociodemographic factors and edentulism: the Nigerian experience. BMC Oral Health 2004; 4:3. doi:10.1186/1472-6831-4-3.

14. Al-Dwairi ZN. Partial edentulism and removable denture construction: a frequency study in Jordanians. Eur J Prosthodont Restor Dent. 2006; 14(1):13-7.

15. Odusanya SA. Tooth loss among Nigerians: causes and pattern of mortality. Int J Oral Maxillofac Surg. 1987; 16(2):184-9.

16. Kaira LS, Dabral E. Prevalence of complete edentulism among Udaipur population of India. The Saudi Journal for Dental Research. 2014; 5(2):139-45.

17. Zaigham AM, Muneer MU. Pattern of partial edentulism and its association with age and gender. Pakistan Oral and Dental Journal. 2010; 30(1):260-3.

18. Pun DK, Waliszewski MP, Waliszewski KJ, Berzins D. Survey of partial removable dental prosthesis (partial RDP) types in a distinct patient population. J Prosthet Dent. 2011; 106:48-56.

Original Article

Nasal Carriage of Methicillin-Resistant Staphylococcus aureus among Healthcare Workers of Sharif Medical City Hospital, Lahore and their Response to Treatment with Mupirocin Ointment

Aqsa Aslam, Maria Aslam, Saima Inam

ABSTRACT

Objective: To detect the frequency of nasal carriage of methicillin-resistant Staphylococcus aureus among healthcare workers of Sharif Medical City Hospital, Lahore and observe their response to treatment with mupirocin ointment.

Methodology: It was a cross-sectional descriptive study conducted at Pathology Department of Sharif Medical City Hospital (SMCH), Lahore. The study was approved by the ethical committee of the hospital. One hundred and two healthcare workers (HCWs) including doctors and paramedical staff were included in the study by probability random sampling. Informed consent was taken from all the participants. The nasal swabs of HCWs were taken and inoculated on blood agar. The plates were incubated for 24-48 hours at 37°C. The isolates of Staphylococcus were identified by colony morphology, gram staining and catalase test. The DNase agar was inoculated for Staphylococcus and incubated for 24 hours at 37°C. The antibiotic (cefoxitin) sensitivity testing of DNase positive Staphylococcus aureus was performed using disc-diffusion method. The zone diameter of 22mm or more was considered sensitive according to Clinical and Laboratory Standards Institute (CLSI) guidelines. The MRSA carrier HCWs were treated with mupirocin ointment for 7 days and their nasal swabs were repeated after treatment.

Results: Out of 102 HCWs, Staphyloccus aureus was isolated from nasal swabs of 25(24.5%) HCWs. Twenty two strains of Staphylococcus aureus were methicillin-sensitive and only 3 were methicillin-resistant. Coagulase-negative Staphylococcus species (CoNS) was predominant in the nasal swabs of most of the HCWs (75.5%). The 3 MRSA positive HCWs were one doctor from pathology department, one staff nurse from nursery and one OTA from anesthesia department. They were given mupirocin nasal ointment for 7 days. Their nasal swabs were again taken after a week. The nasal swabs of all the 3 HCWs became MRSA negative.

Conclusion: The nasal carriage of MRSA was low (2.9%) in Sharif Medical City Hospital, Lahore and mupirocin ointment is effective in the treatment of nasal MRSA carriers.

Keywords: *Methicillin-Resistant Staphylococcus aureus (MRSA). Healthcare workers (HCWs). Mupirocin ointment.*

INTRODUCTION

Staphylococci are the normal flora of skin and nose. Staphylococcus aureus is the most virulent species. Staphylococcus aureus has many virulence factors such as capsule, teichoic acid, protein A, enzymes and toxins. It causes a variety of diseases such as skin, soft tissue and systemic infections as well as exotoxin-mediated diseases. The skin and soft tissue infections include folliculitis, abscess, furuncles, impetigo, carbuncles, cellulitis, conjunctivitis and surgical site infections. The systemic infections are pneumonia, osteomyelitis, arthritis, endocarditis and sepsis. The exotoxin-mediated diseases are food poisoning, toxic shock syndrome and scalded skin syndrome. Staphylococcus aureus is responsible for both community and hospital-acquired infections.[1,2] These infections are still common in hospitalized patients despite the wide use of antibiotics. The detection of methicillin-resistant Staphylococcus aureus (MRSA) is an alarming problem in hospitals.[3] Currently, MRSA has become the most common antibiotic-resistant pathogen worldwide.[4] Hospital-acquired MRSA is common in the Middle East, North Africa, Australia, Italy, Europe and UK. In the year 2008, 44% hospital-acquired infections caused by MRSA were reported in Europe.[5] The infections caused by these strains are very difficult to treat because they are resistant to all beta-lactam antibiotics.[4] Penicillin was first introduced in 1940 and used for the treatment of Staphylococcus aureus infections.[6,7] Staphylococcus aureus resistant to penicillin was first reported in 1945. The mechanism of penicillin resistance is that bacteria acquire an enzyme beta-lactamase which breaks down the ß lactam ring of penicillin. In 1959, a newer penicillin antibiotic methicillin was launched for treatment of penicillin-resistant Staphylococcus aureus strains. However, the bacteria acquired resistance to methicillin after only 2 years in 1961. Methicillin resistance is mediated by mecA gene. The penicillin-binding proteins (PBPs) are normally present in the cell wall of bacteria. These PBPs play a role in the formation of peptidoglycan which is an important component of the bacterial cell wall. The PBPs have a strong affinity for beta-lactam antibiotics. The beta-

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Aqsa Aslam
Assistant Professor Department of Pathology
Sharif Medical & Dental College
E-mail: aksaaslam@hotmail.com

Received: May 2, 2018; Accepted: May 28, 2018.

lactam drugs first bind to PBPs and then inhibit the formation of peptidoglycan. The strains of Staphylococcus aureus acquire resistance to methicillin by encoding a new penicillin-binding protein known as PBP2a. This PBP has decreased affinity for ß-lactam antibiotics so these drugs cannot exert their action.[8,9]

Healthcare workers (HCWs) are a major source of MRSA in addition to colonized patients and contaminated environmental surfaces. The frequency of hospital-acquired infections caused by MRSA is increasing globally. These infections are associated with a prolonged hospital stay, longer antibiotic courses and high costs.[7,10] The colonization of a body site by the pathogen is an important predisposing factor for acquiring the infection. Staphylococcus aureus can colonize many body areas such as nose, axilla and perineum. Nose is most commonly colonized area. It has a major role in the pathogenesis of the disease. The rate of infection is higher in colonized individuals as compared to others. The factors associated with colonization are the chronic disease, antibiotics use and hospitalization.[9,11] Most of the carriers remain well. However, postoperative patients in the recovery phase, immunocompromised patients and patients with severe disease are more prone to develop infections.[2] According to a study, approximately 20% of the population are persistent carriers of Staphyloccocus aureus, 30% are intermittent carriers and 50% are non-carriers.[12] The persistent carrier state commonly occurs in healthcare workers and in the hospital environment.[2] Mupirocin is the most effective drug for MRSA nasal carriers. The success rate is 90% after 1 week of treatment. The drug resistance was reported in 1% patients after treatment with mipirocin ointment.[12]

The prevalence of MRSA infections is high in the hospitals. Therefore, this study was planned to identify MRSA positive healthcare workers so that further transmission of MRSA can be prevented.

METHODOLOGY

The study was conducted at Pathology Department of Sharif Medical City Hospital, Lahore. It was a cross-sectional descriptive study. The study was approved from the ethical committee of the hospital. One hundred and two healthcare workers including doctors and paramedical staff were included in the study by probability random sampling. The participants were from operation theaters, intensive care units (ICUs), coronary care units (CCUs), laboratory, surgery, medicine, paediatrics, gynaecology and pathology department. Informed consent was taken from all the participants and the sampling technique was explained to them. The nasal swabs of HCWs were taken. The sterile cotton swab was rotated 5 times in the anterior nares of both the nostrils. The name, age, designation and relevant department of HCWs were noted on request form. The nasal swabs were inoculated on blood agar. The plates were incubated for 24-48 hours at 37°C. The isolates of Staphylococcus were identified by colony morphology, gram staining and catalase test. The DNase agar was inoculated for Staphylococcus and incubated for 24 hours at 37°C. The Staphylococcus isolates that produced a clear zone around inoculated area after addition of 1N hydrochloric acid were labeled as Staphylococcus aureus. The antibiotic (cefoxitin) sensitivity testing was performed using disc-diffusion method. The suspension of Staphylococcus aureus was made in normal saline, matched with turbidity standard (0.5 MacFarland) and then inoculated on Mueller-Hinton agar plate. The cefoxitin disc was applied on the plate and incubated for 24 hours at 35°C. Cefoxitin is used to report methicillin sensitive or resistant. The zone diameter of 22mm or more was considered sensitive according to Clinical and Laboratory Standards Institute (CLSI) guidelines (2017). The isolates giving zone of $\geqslant$22mm were reported as methicillin-sensitive and isolates giving zone of <22mm were reported as methicillin-resistant.[13] The MRSA carrier HCWs were isolated and advised to use face masks, saline nasal washing and mupirocin ointment for 7 days. Their nasal swabs were repeated after treatment.

STATISTICAL ANALYSIS

The data analysis was done using Statistical Package for Social Sciences (SPSS) version 24. The quantitative variables were presented as the mean±standard deviation and the qualitative variables were expressed as frequency & percentage. The p-value of ≤0.05 was considered statistically significant.

RESULTS

The mean age of the study participants was 32±8.94 years. Fifty seven healthcare workers were females and 45 were males. Twenty six (25.5%) participants were from pathology department, 14(13.7%) from ICUs, 4(3.9%) from CCU, 7(6.9%) from nursery, 4(3.9%) from anesthesia, 4(3.9%) from surgery, 5(4.9%) from gynaecology & obstetrics, 5(4.9%) from medicine, 5(4.9%) from pediatrics, 28(27.5%) from operation theaters. Thirty two (31.4%) HCWs were doctors, 28 (27.5%) nurses, 16(15.7%) lab technicians, 17(16.7%) OTAs and 9(8.7%) were ward boys.

Out of 102 HCWs, Staphyloccus aureus was isolated from nasal swabs of 25(24.5%) HCWs. Twenty two (88%) strains of Staphylococcus aureus were methicillin-sensitive and only 3(12%) were methicillin -resistant. Coagulase-negative Staphylococcus species (CoNS) was predominant in the nasal swabs of most of the HCWs (77 HCWs, 75.5%).

Table 1: Frequency distribution of study participants

Department	Frequency	Percentage
Pathology	26	25.5
ICU	14	13.7
CCU	4	3.9
Nursery	7	6.9
Anesthesia	4	3.9
Surgery	4	3.9
Gynaecology & Obstetrics	5	4.9
Medicine	5	4.9
Pediatrics	5	4.9
Operation theaters	28	27.5%

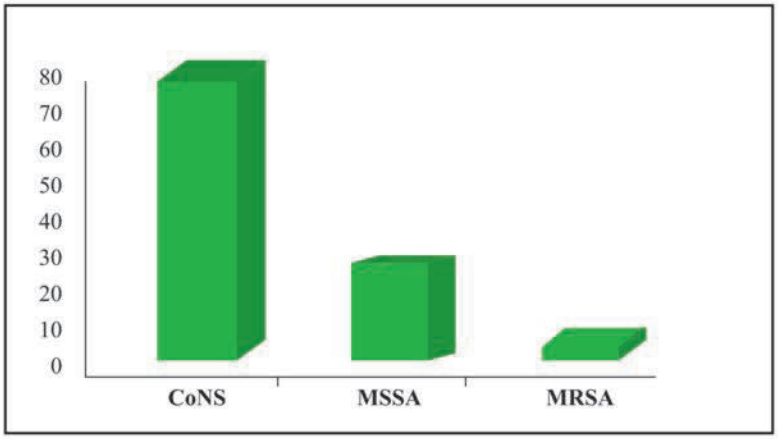


Figure 1: Frequency of CoNS, MSSA and MRSA in nasal swabs of healthcare workers

Among the 22 methicillin-sensitive Staphylococcus aureus (MSSA) strains, 4 were isolated from pathology laboratory technicians, 4 from ICU staff, 3 from nursery staff, 6 from OT staff and 5 from doctors. The 3 MRSA positive HCWs were one doctor from pathology department, one staff nurse from nursery and one OTA from anesthesia department. The ones from nursery and anesthesia OT were shifted from their duty to wards. All MRSA positive HCWs were advised to use face masks, saline nasal wash and mupirocin nasal ointment for 7 days. Their nasal swabs were again taken after a week. The nasal swabs of all the 3 HCWs became MRSA negative.

DISCUSSION

The incidence of Staphylococcus aureus infections has increased in the last 200 years. Various studies showed that 20 to 30% healthcare workers are colonized with Staphylococcus aureus and they transmit the bacteria. Infection outbreaks have been reported from intensive care units, burn units, nurseries and surgical units. These outbreaks are related to inappropriate use of antibiotics, inadequate nursing care, lack of hand washing and presence of nasal carriers among the healthcare workers.[2]

The prevalence of MRSA in healthcare workers varies greatly worldwide according to literature. It can be attributed to the difference in sampling technique, culture inoculation, its interpretation, the prevalence of MRSA in that area and infection control measures.[3] The frequency of MRSA in HCWs was 12.7% in Ethiopia,[3] 25.5% in Gaza strip,[14] **32.8% in Iran,**[15] 13.5% in Egypt,[16] zero in Kenya,[5] 4.6% in Germany,[1] 4.7% in China[11] and 4.6% in Switzerland.[19]

Our results showed that the prevalence of MRSA in HCWs was 2.9%. This was in accordance with other studies in which the MRSA carriage rate was low.[6,17] In a study done in Germany, 726 HCWs were enrolled for nasal swabs screening. Methicillin-resistant Staphylococcus aureus was isolated from 4.6% HCWs. The prevalence rate was higher in nurses than in physicians.[17] In another study conducted in Germany,

759 nursing staff and 422 residents were enrolled from 19 institutions. Prevalence of MRSA was 1.6% among staff and 5.5% among residents.[18] In Kenya, 246 healthcare workers were randomly screened for nasal carriage of MRSA. Methicillin-resistant Staphylococcus aureus was not isolated whereas methicillin-sensitive Staphylococcus aureus (MSSA) was found in 18.3% of HCWs.[6]

A study conducted at Holy Family Hospital, Rawalpindi enrolled 468 HCWs. Eighty five (18.2%) HCWs were nasal carriers of Staphylococcus aureus, of which 7(1.5%) were methicillin-resistant. Staphylococcus aureus was found in 30% midwives, 23.5% technicians, 22.7% nurses and 20% house officers. The nasal carriage of Staphylococcus aureus was highest in surgical ICU (40%) followed by gynaecology (34.9%) and medicine (22.7%).[20]

According to a study by Arshad et al. in Jinnah Hospital Lahore, the nasal swabs were positive for Staphylococcus aureus and CoNS in 40% and 60% healthcare workers. Out of 40% Staphylococcus aureus strains, 67.5% were MRSA.[1]

The study conducted in the Children Hospital Complex, Multan included 129 HCWs. Staphylococcus aureus was isolated in the anterior nares of 48 HCWs out of which 13.95% were MRSA. Most of the HCWs with nasal carriage were nurses and doctors. Meticillin-resistant Staphylococcus aureus was isolated in 27.3% nurses and 18.5% doctors.[2]

A study conducted in Ethiopia revealed 12.7% nasal carriage rate of MRSA among healthcare workers. One hundred eighteen HCWs were included in that study. Out of 118, 34(28.8%) were Staphylococcus aureus carriers and 15(12.7%) were MRSA carriers. The greatest carriage rate was found in nurses (21.2%) followed by doctors (12.5%) and technicians (12.5%). Most of the HCWs in pediatrics and surgery department were carriers.[3] In another study done in Argentina, out of 320 HCWs, 96(30%) were nasal carriers of Staphylococcus aureus. Twenty carried MRSA and 76 MSSA. The carriage rate was 57% in technicians and 30% in physicians.[21]

El-Aila et al. reported that among 200 healthcare workers, 51(2.5%) carried MRSA. The carriage rate among nurses and doctors was 30.4% and 16% respectively. Most of the MRSA carriers were from medicine and surgery department (41.3 and 35% respectively).[14]

CONCLUSION

The nasal carriage of MRSA was low (2.9%) in Sharif Medical City Hospital, Lahore and mupirocin ointment is effective in the treatment of nasal MRSA carriers.

RECOMMENDATIONS

- The healthcare workers should be enrolled from various hospitals to see the frequency of nasal carriage of MRSA in different setups. So that the transmission of MRSA can be prevented.
- The infection control measures including personal protective equipment and hand washing should be strictly observed by doctors & paramedical staff in hospitals to avoid the transmission of MRSA.

REFERENCES

1. Arshad J, Rasheed F, Yousaf NW, Iram S. Nasal carriage rate of methicilin-resistant Staphylococcus aureus (MRSA) among healthcare workers of a tertiary care hospital. Biomedica. 2017 March; 33(1):9-13

2. Rashid Z, Farzana K, Sattar A, Murtaza G. Prevalence of nasal Staphylococcus aureus and methicillin-resistant Staphylococcus aureus in hospital personnel and associated risk factors. Acta Poloniae Pharmaceutica and Drug Research. 2012; 69 (5):985-91.

3. Shibabaw A, Abebe T, Mihret A. Nasal carriage rate of methicillin-resistant Staphylococcus aureus among Dessie Referral Hospital healthcare workers; Dessie, Northeast Ethiopia. Antimicrobial Resistance and Infection Control. 2013; 2:25.

4. Truong H, Shah SS, Ludmir J, Tawanana EO, Bafana M, Wood SM, et al. Staphylococcus aureus skin and soft-tissue infections at a tertiary hospital in Botswana. S Afr Med J. 2011 June; 101(6):413-6.

5. Green BN, Johnson CD, Egan JT, Rosenthal M, Griffith EA, Evans MW. Methicillin-resistant Staphylococcus aureus: an overview for manual therapists. Journal of Chiropractic Medicine. 2012; 11:64-76.

6. Omuse G, Kariuki S, Revathi G. Unexpected absence of meticillin-resistant Staphylococcus aureus nasal carriage by healthcare workers in a tertiary hospital in Kenya. J Hosp Infect. 2012, 80(1):71-3.

7. Kumar P, Shukla I, Varshney S. Nasal screening of healthcare workers for nasal carriage of coagulase positive MRSA and prevalence of nasal colonization with Staphylococcus aureus. Biology and Medicine. 2011; 3(2):182-6.

8. Askarian M, Zeinalzadeh A, Japoni A, Alborzi A,Memish ZA. Prevalence of nasal carriage of methicillin-resistant Staphylococcus aureus and its antibiotic susceptibility patten in healthcare workers at Namazi Hospital, Shiraz, Iran. International journal of infectious diseases. 2009; 13(5):241-7.

9. Halablab MA, Hijazi SM, Fawzi MA, Araj GF. Staphylococcus aureus nasal carriage rate and associated risk factors in individuals in the community.. Epidemiol Infect. 2010 May; 138(5):702-6.

10. Kirecci E, Ozer A, Aral M, Miraloglu M. Research of nasal methicillin-resistant/sensitive Staphylococcus aureus and pharyngeal beta-haemolytic streptococcus carriage in midwifery students in Kahramanmaras, Eastern Mediterranean Region of Turkey. Ethiop. J Health Dev. 2010; 24(1):57-60.

11. Chen BJ, Xie XY, Ni LJ, Dai XL, Lu Y, Wu XQ, et al. Factors associated with Staphylococcus aureus nasal carriage and molecular characteristics among the general populationat a Medical College Campus in Guangzhou, South China. Ann Clin Microbiol Antimicrob.2017; 16(28):1-10.

12. Ammerlaan HSM, Kluytmans AJW, Wertheim HFL, Nouwen JL, Bonten MJM. Eradication of methicillin-resistant Staphylococcus aureus carriage: A systematic review. Healthcare Epidemiology. 2009; 48:922-9.

13. Clinical and Laboratory Standards Institute. Performance standards for antimicrobial disk susceptibility tests: approved standard. 27th ed. Wayne (PA): Clinical and Laboratory Standards Institute; 2017.

14. El-Aila NA, Al Laham NA, Ayesh BM. Nasal carriage of methicillin-resistant Staphylococcus aureus among healthcare workers at Al Shifa hospital in Gaza Strip. BMC Infectious Diseases. 2017; 17(28):1-7.

15. Emaneini M, Jabalameli F, Rahdar H, van Leeuwen WB, Beigverdi R. Nasal carriage rate of methicillin resistant Staphylococcus aureus among Iranian healthcare workers: a systematic review and meta-analysis. Rev Soc Bras Med Trop. 2017; 50(5):590-7.

16. Hefzy EM, Hassan GM, Abd El Reheem F. Detection of Panton-Valentine leukocidin-positive methicillin-resistant Staphylococcus aureus nasal carriage among Egyptian health care workers. Surg Infect (Larchmt). 2016; 17(3):369-75.

17. Sassmannshausen R, Deurenberg RH, Kock R, Hendrix R, Jurke A, Rossen JWA, et al. MRSA prevalence and associated risk factors among healthcare workers in non-outbreak situations in the Dutch-German Euregio. Front Microbiol. 2016; 7(1273):1-8.

18. Peters C, Dulon M, Kleinmuller O, Nienhaus A, Schablon A. MRSA pevalence and risk factors among health personnel and residents in nursing homes in Hamburg, Germany: a cross-sectional study. Plos one. 2017; 12(1):1-13.

19. Albrich WC, Harbarth S. Healthcare workers: source, vector, or victim of MRSA? Lancet Infect Dis. 2008; 8(5):289-301.

20. Akhtar N. Staphylococcal nasal carriage of health care workers. J Coll Physicians Surg Pak. 2010 Jul; 20(7):439-43. doi: 07.2010/JCPSP.439443.

21. Boncompaina CA, Suarez CA, Morbidoni HR. Staphylococcus aureus nasal carriage in health care workers: First report from a major public hospital in Argentina. Rev Argent Microbiol. 2017; 49(2):125-31.

Retained Foreign Body in Hand: Presented with Claw Hand

Farooq Azam Khan

INTRODUCTION

Foreign body intrusions into the hand are among the most common injuries of the upper limbs reported in the Emergency Department.[1,2] Persisting foreign objects in the hand can compromise important anatomic structures and may become a source of infection.[3,4] Radiolucent foreign objects are routinely missed on radiography and are diagnostic challenge.[5]

A 21-year-old male patient presented in OPD with development of right hand clawing for 08 weeks. He gave history of the fall on an outstretched hand with more pressure on ulnar side. On examination slight wasting of hypothenar eminence and healed scar mark was noted. There was tenderness in the distal carpal region especially along hamate bone. X-ray wrist showed no pathology. Magnestic resolution imaging confirmed laceration of ulnar nerve distal to guyon's canal and retained foreign body.

Figure 1: Showing marked skin incision. The healed scar mark in the hypothenar eminence is also visible

Figure 2: Incision given in the marked area

Sharif Medical & Dental College, Sharif Medical City. Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.

Correspondence: Dr. Farooq Azam Khan
Assistant Professor Department of Orthopaedic Surgery
Sharif Medical & Dental College
E-mail: dr.farooq224@hotmail.com

Received: March 5, 2018; Accepted: March 8, 2018.

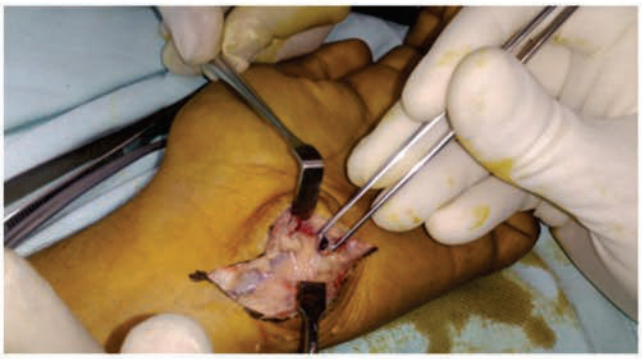


Figure 3: Guyon's canal released. Glistening foreign body in hypothenar muscles identified

Figure 4: Sharp glass piece with injury to the ulnar nerve.

Figure 5: Lacerated ulnar nerve

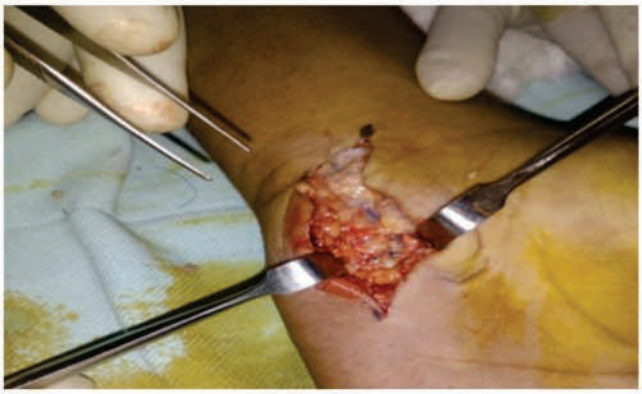


Figure 6: Repair of ulnar nerve and removal of foreign body from hypothenar space

REFERENCES

1. Salati SA, Rizvi T, Rabah SM. Missed Foreign Body Presenting as a Chronically Painful Hand. East and Central African Journal of Surger. 2010; 15(1):144-6.

2. Ipaktchi K, DeMars A, Park J, Ciarallo C, Livermore M, Banegas R. Retained palmar foreign body presenting as a late hand infection: proposed diagnostic algorithm to detect radiolucent objects. Patient Saf Surg. 2013; 7: 25.

3. Potini VC, Francisco R, Shamian B, Tan V. Sequelae of foreign bodies in the wrist and hand. Hand. 2013 Mar; 8(1):77-81. doi: 10.1007/s11552-012-9481-6.

4. Salati SA, Rather A. Missed foreign bodies in the hand: an experience from a center in Kashmir. Libyan J Med. 2010 Apr 12;5. doi:10.3402/ ljm. v5i0. 5083.

5. Donaldson JS. Radiographic imaging of foreign bodies in the hand. Hand Clin. 1991 Feb; 7(1):125-34.

Corrigendum: Incorrect Name of the Department of the Corresponding Author

Article Name: Association of Obesity and Knee Osteoarthritis

Farooq Azam Khan, Ahmad Rasool, Hajra Tariq, Abbas Bajwa

JSMDC 2017;3(2):76-9

In this article, the name of the department of the corresponding author was given incorrectly.

The correct name of the department of the corresponding author, Dr. Farooq Azam Khan is

Orthopaedic Surgery

Instructions to Authors

The JSMDC, the Journal of Sharif Medical & Dental College agrees to accept manuscripts prepared in accordance with the 'Uniform Requirements for a manuscript submitted to the Biomedical Journals' as approved by the International Committee of Medical Journal Editors (ICMJE) guidelines, published in the British Medical Journal 1991 302:334-41.

Scope: JSMDC publishes original articles concerning research in Basic/Clinical Sciences and Allied Health Sciences.

Ethical/Legal considerations: A submitted manuscript must be an original contribution not previously published (except as an abstract or preliminary report), must not be under consideration for publication elsewhere, and if accepted, it must not be published elsewhere in similar form. Each person listed as an author is expected to have participated in the study to a significant extent. Although the editors and referees make every effort to ensure the validity of published manuscripts, the final responsibility rests with the authors, not with the Journal, its editors, or the publisher. All manuscripts must be submitted by email to the address editors@jsmdc.pk

Financial disclosure: Each author warrants that he or she has no commercial associations (e.g., consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted article, except as disclosed on a separate attachment. All funding sources supporting the work and all institutional or corporate affiliations of the authors are acknowledged in a footnote in the work.

Patient anonymity and informed consent: It is the author's responsibility to ensure that a patient's anonymity be carefully protected and to verify that any experimental investigation with human subjects reported in the manuscript was performed with informed consent and following all the guidelines for experimental investigation with human subjects required by the institution(s) with which all the authors are affiliated.

Copyright: All authors must sign a copy of JSMDC's authors certification proforma including information regarding responsibilities of authors and Copyright Transfer and submit it with the article.

Permissions: Authors must submit written permission from the copyright owner (usually the publisher) to use direct quotations, tables, or illustrations that have appeared in copyrighted form elsewhere, along with complete details about the source.

Original articles: Should normally report original research of relevance to clinical medicine. It should contain a structured abstract of about 250 words. Three to five keywords should be given for an original article as per MeSH (Medical Subject Headings). There should be three to five tables or illustrations. The data should be supported with 15 to 25 references. Most of the references should be from last five years from the date of submission.

Clinical case reports: Must be of academic and educational value and provide relevance of the disease being reported as unusual. It should have a non-structured abstract of about 100-150 words (case specific) with around 5-6 references and 3 keywords.

Letters to the editor: It is usually a type of short communication that can be written on any topic that attracts the attention of the reader. There are different types of Letters to the Editor (LTE). If the purpose of the LTE is to comment on a published article, the first sentence of the LTE should include the name of the published article's first author along with the title of the published article and then the comments. If the LTE is a reply to a previously submitted LTE, the first sentence should include the name of the letter's author and cite the letter as a reference. The previously published article should then be referenced as well either in the body of the text or at the end of the response to the LTE.

Photo essays: The journal accepts manuscripts for consideration as photo essays. These essays include the visual presentation of material where the primary emphasis is on the images. These images can include color images, angiograms, optical coherence tomography, histologic sections, x-rays, ultrasounds, and other studies. The images can be an outstanding presentation of classic findings, atypical findings or new findings. These are not case reports, but rather a visual presentation of material as a teaching tool. The images need to be of the highest quality. The

accompanying manuscript should be limited to a total of 300 words. A maximum of 5 separate images and 5 references can be included. All figures submitted in color are published in color, at the expense of the author. Please refer to the rest of the author instructions for other requirements for manuscripts submitted to JSMDC.

Review article: Should consist of critical overview/analysis of some relatively narrow topic providing background and the recent development with the reference of original literature. It should incorporate author's original work on the same subject. The length of the review article should be of 2500 to 3000 words with a minimum of 30 references. It should have a non-structured abstract of 150 words with minimum 3 keywords. An author can write a review article only if he/she has written a minimum of three original research articles.

Other sections: The journal also accepts manuscripts for other sections such as diagnostic & therapeutic challenges, clinicopathologic correlations, surgical techniques, and new instruments. All manuscripts must be double-spaced, include a Title Page and have no more than 5 pages of manuscript text in length, 4 figures and 5 references. The format for all submitted manuscripts is basically as described above with a few exceptions. Diagnostic & therapeutic challenges require no abstract and have no limit for figures and references. Surgical techniques and clinicopathologic correlations are treated like a full manuscript and require an abstract. All correspondence and new instruments should have a standard title page with full-length title, running title, and author information. Keywords and summary statement should be on the second page. An abstract is not required by the journal for correspondence and new instruments. A summary statement of 50 words is necessary for publication and indexing and must be included at the time of submission. All pages must be numbered starting with the title page being page one. Each figure must be submitted separately. All colored figures will be published in this section at the authors' expense.

Authorship criteria: As stated in the uniform requirements, credit for authorship requires substantial contributions to **(a)** the conception and design or analysis and interpretation of the data, **(b)** the drafting of the article or critical revision for important intellectual content, critical appraisal of findings with literature search and actual write up of manuscript, **(c)** final approval of the version to be published. Each author must sign a statement attesting that he or she fulfills the authorship criteria of the uniform requirements. Up to six authors are allowed in a single institution study. In a multi-institution and international collaborative research, Editorial Board shall guide on an individual case basis. JSMDC strongly discourages gift authorship. More supervision, collections of data, statistical analysis and language correction does not grant authorship rights. Ideally, all authors should belong to the same department of an institute, except for multi-center and multi-specialty studies. The Journal discourages submission of more than one article dealing with related aspects of the same study. The journal also discourages the submission of case reports unless unreported from Pakistan. Unusual but already reported cases should, therefore, be submitted as letters to the editor.

Plagiarism Policy: Journal of Sharif Medical & Dental College follows the PMDC and HEC criteria for all types of plagiarism. The criteria can be accessed at pmdc.org.pk and www.hec.gov.pk. All the submitted manuscripts will be checked for potential plagiarism by "TURNITIN" software. Articles with similarity index more than 19% will not be published. If the submitted article is found to have been totally or substantially plagiarized then the article is rejected outright with information to the author. Plagiarism certificate is sent to the corresponding author and the article is reconsidered after amendments. For published articles, the allegedly plagiarized article will be temporarily retracted from the issue and a notice to the effect will be published in the JSMDC.

Peer Review: Once the corrected article is received from the author, the manuscript is sent to two independent peer reviewers of the specialty. Comments from two reviewers are mandatory for review of a manuscript. Once the reviewed manuscript is received from both the reviewers, their comments/suggestions are communicated to the author for correction. The revised version received from the author is re-assessed by the editor.

MANUSCRIPT SUBMISSION GUIDELINES

Abstract: It should be structured and include the following subheadings:
Objectives, Methodology, Results, Conclusion and Keywords. It should contain up to 250 words. Three to five keywords should be given for an original article as per MeSH (Medical Subject Headings).
Introduction: It should clearly describe the topic with brief literature review. All abbreviations used should be first preceded by the word for which it stands. At the end of introduction mention the rationale or scientific significance of

the study.

Methodology: Study design, place of the study conducted, sampling technique, ethical consideration and method & equipment used for research work should be mentioned.

Statistical Analysis: Mention the software used for data analysis and the statistical tests applied.

Results: Text, table and figures should be used for illustration of results. Figures should be numbered in order of appearance in the text. Legends for the figures should be typed DOUBLE-SPACED and should include a description of features shown. Tables should be typed double-spaced, with nothing underlined. Please triple-check all numbers and percentages. Previously published material and figures should include permission to reproduce from the original publication and original author. Photographs with faces should be accompanied by permission to publish from the subject of the photograph or by a parent in case of a minor. Colored photographs should be submitted in JPEG format. Journal reserves the right to charge authors for reproduction of colored pictures. The journal only accepts manuscripts in English.

Discussion: The results of the study should be interpreted with reference to other studies

Conclusion

Limitations of the study (if any)

Recommendations of the study (if any)

References: References must be numbered consecutively, according to their appearance in the text. References should be cited in the "Vancouver style" and 15-30 references of the last 5 years should be given.

SHARIF TRUST

Sharif Medical & Dental College

Sharif Medical City Road, Off Raiwind Road, Jati Umra, Lahore 54000, Pakistan.
Tel: +92-4237860101-4 Fax: +92-4237860122 UAN- 042-111-123-786
E-mail:editor@jsmdc.pk Web:www.sharifmedicalcity.org