JSMDC

Journal of Sharif Medical & Dental College

Volume 01 | Number 02 | December 2015

## EDITORIAL I



## ORIGINAL ARTICLES II

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

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**Printed by**
**ALIGARH Publisher**
Ghalib Market, Gulberg III,
Lahore 54660
Ph:042-35771801-8
Fax:042-35759101
www.aligarh.com.pk

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

Editorial

# Clinical Laboratory Accreditation: Need of Modern Laboratory Medicine

Salma Haq

Laboratory medicine is the backbone of the health care delivery system. Clinical laboratories play a pivotal role in the health of a patient regarding diagnosis, prevention and management of the disease. The analytical results generated by the laboratory influence the health care decisions thus being of paramount importance to the health and safety of patients.[1] Reliable laboratory results, therefore, are a dire need of health care system.

Accreditation is a process of evaluation and validation of a clinical laboratory against an internationally recognized set of standards. It is a procedure by which an authoritative body gives formal recognition that certain laboratory can carry out specific tests producing valid results. Laboratory accreditation is done in several countries by independent national accreditation bodies. These national bodies are in turn members of regional and international accreditation organizations. One example is PNAC, the Pakistan National Accreditation Council which is a signatory with International Lab Accreditation Cooperation (ILAC).[2]

In order to provide valid results and high quality patient care, all clinical laboratories are expected to comply with international standards and guidelines.[3] The international standards were developed way back in an early twentieth century for quality management of organizations and were available as ISO 9000 series which was later revised and published as ISO 9001: 2000. The experts producing these guidelines were fully aware of changing lab culture and modern needs of patient care system. This resulted in further deliberations and revision of these existing standards. The proposed revised version once again was focused on quality management. Evaluation of technical competency of testing laboratories was a deficient parameter however. Later, another standard ISO 17025 was designed to assess the technical competency of any type of calibration or testing laboratory. Considering the significance of both, quality management system (QMS) and technical competence, in 2003, the first edition of an international standard, the ISO 15189 "medical laboratories- requirements of quality and competence" was proposed. This laboratory standard combines the requirements of ISO 9001 and ISO/IEC 17025 and caters both for the requirements for quality management and the competence of the laboratory to undertake a specified task. It is a comprehensive document. Its main emphasis is not only on the quality of measurement but also on patient care, needs and requirements of the users of laboratory services, medical ethics and continual improvement.[4-6]

All sections of these standards are being continuously revised by various international committees and groups. Later includes European Communities Confederation of Clinical Chemistry-EC4, International Laboratory Accreditation Cooperation (ILAC), Clinical Pathology Accreditation (UK) Ltd (CPA), Standard Revision Group (SRG). These revisions are carried out with the aim to rectify the anomalies if any, which arise in interpretation of the standards leading to inconsistency at the time of inspection.[6]

The process of accreditation requires an enthusiastic team with sufficient background knowledge of quality management system and requirement of technical processes in the laboratory. This includes inspectors/assessors who evaluate the compliance with the clinical laboratory standards ISO 15189 for delivering quality services as well as the technical competence.

Appropriate education and training of assessors/ inspectors for this assessment are the prerequisites. All developed and majority of underdeveloped countries have national accreditation bodies which cooperate with the scientific societies to assure training and competence of assessors. This ensures an appropriate approach for evaluating the competence of a medical laboratory in providing an effective service to its customers and users.[6]

Accreditation as per ISO 15189 is a voluntary process. Yet to improve the quality of diagnostic services, laboratory accreditation procedure based on ISO 15189:2012 remains the single most effective tool.[7]

Accreditation assures the creditability of the laboratories and generates clinician and patient

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*Received: August15, 2015; Accepted: September 15, 2015.*

confidence in the test results. It encourages and enforces improvement in the quality and reliability of laboratories. Accreditation provides implementing and monitoring a comprehensive laboratory management system.[3,8] It provides verification that laboratories are adhering to established quality and competence standards necessary for reliable patient testing and the safety of staff and the environment.[9]

Accreditation provides a mechanism by which patient, health care organization and governments can measure the performance of laboratories against international standards.[10] Test reports generated in accredited laboratories are accepted all over the world and the laboratories are recognized for superior test reliability, operational performance, quality management and competence.

One has to remember that accreditation is not about who the best is, but who has a system of standard procedures. Accreditation is an instrument which increases the quality with high standards of services for patients and physicians.

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Original Article

# Assessment of the Knowledge of Households about Dengue Fever in a Rural Community

Seemal Vehra, Ejaz Mahmood, Muhammad Anwer Sulehri, Samina Khalid, Naeem Malhi, Muhammad Akram, Muhammad Fayyaz Atif, Muhammad Shahid Iqbal

**ABSTRACT**

**Objective:** The objective of the study was to assess the knowledge of households about the dengue fever.

**Methodology:** It was a cross-sectional descriptive study in which 250 adults of UC Wang, Tehsil Rajanpur, District Rajanpur were interviewed. Data was collected through a questionnaire which was analyzed by computer using Epi Info 6.

**Results:** Among 250 respondents, 94 (37.6%) were illiterate. A statistically significant relationship was found between age of respondents and awareness about dengue fever transmission by mosquito and source of information about dengue fever transmission. Occupation of 228(91.2%) respondents was agriculture. Out of 250, 237 (94.8%) respondents were aware that dengue fever spreads by the mosquito. One hundred and ninety four (77.6%) respondents had acquired knowledge about dengue from television. Two hundred and thirteen (85.2%) respondents believed that hospitals were the best places for dengue treatment. One hundred and thirty nine (55.6%) respondents believed that dengue fever is related to rainfall. One hundred and fifty three (61.2%) respondents used bed nets to prevent from the mosquito bite. One hundred and fifty two (68.0%) used insecticide spray for the prevention of mosquito breeding. A statistically significant (P-value = 0.00) relationship was found between the educational status of respondents and knowledge about the peak time of mosquito and knowledge about clean stagnant water as favorable conditions for dengue mosquito breeding sites.

**Conclusion:** Most of the respondents had good knowledge about dengue fever, its transmission, the peak time of mosquito bite, signs and symptoms of dengue fever and treatment. Most of them stored water in the houses but they were ignorant about the importance of covering the container and pots. Health education about dengue control and prevention should be imparted to health personnel who are in direct contact with community

**Keywords:** *Dengue fever. Knowledge of households. Rural community.*

## INTRODUCTION

Dengue fever (DF) is an acute febrile viral disease, spread through dengue mosquitoes and presents with a severe headache, pain in the eyes, muscle and joint pain as well as rash. Dengue hemorrhagic fever (DHF) presents with dengue-like symptoms in addition to hemorrhagic manifestations like petechial skin hemorrhage, hepatomegaly, and circulatory disturbances. There are four known virus serotypes (DEN 1, DEN 2, DEN 3 and DEN 4). The virus is transmitted by the Aedes mosquito, of which Aedes aegypti is the most important vector.[1]

Global trends in urbanization, substandard housing, intentional or unintentional water storage patterns, and population growth have created environments that favor transmission of DF.[2] It is estimated that each year 50 million infections occur with five lac cases of dengue hemorrhagic fever and at least 12 thousand deaths mainly among children occur throughout the world. The increase incidence of dengue and dengue hemorrhagic fever is due to uncontrolled population growth and urbanization without appropriate water management.[3,4]

Currently, dengue cases are being reported from all the provinces of Pakistan especially more cases from Sindh and the Punjab with mortality also. A number of factors could be responsible like still not applying due precautions. An overwhelming number of people are still ignorant about this lethal illness. The situation is grimmer in rural communities where the majority of people have either scanty or no information about it which is very unfortunate. Even the situation in the urban settings is not up to the mark.

A number of studies have been conducted in major cities about the assessment of dengue fever with different findings. Very few studies have been conducted among rural communities where it is essential to launch such study to know their baseline knowledge. There is dire need to update their knowledge in the light of findings by proper health education programs. In the light of above factors, this study was conducted in this remote area of the Punjab to assess the knowledge of households.

## METHODOLOGY

It was a descriptive cross-sectional study conducted at the rural area (U/C Wang) of Tehsil Rajanpur, District Rajanpur with a population of 32864 people. Adult population (both males and females) of U/C Wang,

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*Received: August16, 2015; Accepted: October 20, 2015.*

Tehsil Rajanpur, District Rajanpur were included in this study. The study was approved from the ethical committee of the hospital. List of all adults (both males and females) registered with District Government was taken from the records of Tehsil Municipal Administration (TMA) Office, Tehsil Rajanpur, District Rajanpur. The sample size of this study was 250 which was calculated by the statistical software. Simple random sampling was done. For the purpose of randomization whole union council was divided into three parts, North, South and Central regions. The sample of 1/3 of 250 persons (83, 83 and 84 people) was taken from each region. Informed consent was taken. An attempt was made to interview an equal number of males and females in each region. A semi-structured questionnaire was prepared by researcher and finalized after pretesting. Executive District Officer (EDO) and Incharge of Dengue Prevention and Control Program were contacted and asked to nominate the persons (LHWs etc.) who accompanied the interviewer for taking information.

Data was analyzed with Epi-info 6 software. Chi-square test was applied between different categorical variables. P-value<0.05 was used as a cutoff point for statistical significance.

## RESULTS

Out of 250 respondents, 106 (42.4%) were 25-39 years old, 77 (30.8%) respondents were 40-54 years old. One hundred and forty six (58.4%) were males and 104 (41.6%) were females. Two hundred and forty seven (98.8%) respondents were living in rural areas while only 3(1.2%) were living in semi-urban areas. Out of 250, 94 (37.6%) respondents were illiterate, 156 (62.4%) were educated. Majority 228 (91.2%) respondents were agriculture workers (Table 1).

Out of 250 respondents, 5 (2.0%) respondents believed that dengue fever spread by housefly, 237 (94.8%) respondents were aware that dengue fever spread by mosquito, 4 (1.6%) respondents believed that dengue fever spread by food sharing and 5 (2.0%) said it is spread by human contact. Majority 194 (77.6%) respondents acquired knowledge from television (Table 2).

One hundred and ninety four (77.6%) respondents had knowledge that sunrise is the peak time of mosquito bite whereas 208 (83.2%) had knowledge that sunset is the peak time of mosquito bite. Among these respondents, 157 (62.8%) had knowledge that fever is a symptom of dengue fever, 150 (60.0%) believed that chills and 149 (59.6%) believed rashes are the symptoms of dengue fever. Similarly, 123 (49.2%) respondents said muscular pain/bone pains and 135 (54.0%) said bleeding are the symptoms of dengue fever while 145(58.0%) believed eye pain is a symptom of dengue fever. Thirty (12.0%) respondents were aware that general practitioners are the concerned persons for dengue treatment whereas, 213 (85.2%) believed that hospitals are the best places for dengue treatment. Only 15 (6.0%) respondents preferred hakeem/homeo physicians for dengue treatment (Table 3).

Only 100 (40.0%) respondents were aware that mosquitoes need water for breeding. Similarly, 154 (61.6%) respondents claimed that clean stagnant water is required for breeding and 135 (54.0%) had knowledge that rain water is a favorable place for dengue mosquito breeding. One hundred and twenty (48.0%) were aware that garbage collection is potential breeding sites and 151 (60.4%) respondents had knowledge about the tyre. Similarly, 129 (51.6%), 160 (64.0%) and 160 (64.0%) respondents were of the opinion that flower pots, air coolers and water ponds are the breeding sites of mosquitoes respectively (Table 4).

Regarding prevention from a mosquito bite, 153 (61.2%) used bed nets, 167 (66.8%) respondents used coils and mats, 161 (35.6%) applied repellents and 28 (11.2%) were using fans. Similarly, 179 (71.6%) respondents installed window screens, 155 (62.5%) sprayed insecticide in their houses, 160 (64.0%) drained stagnant water, 173 (69.2%) covered stored water and 141(56.4%) respondents destroyed the old tyres while 146 (58.4%) maintained cleanliness (Table 5).

The majority of respondents got information from the TV as compared to other means of mass media. The result was found statistically significant (P-value = 0.04) similarly result was found statistically significant (P-value = 0.00) while comparing the relationship of educational status with peak time of mosquito bite and clean stagnant water as a breeding place (Table 6).

**Table 1: Socio-demographic characteristics of respondents**

| Characteristics | Frequency | Percentage |
|---|---|---|
| **Age (in years)** | | |
| < 25 | 37 | 14.8 |
| 25-39 | 106 | 42.4 |
| 40-54 | 77 | 30.8 |
| 55-69 | 24 | 9.6 |
| 70 and above | 6 | 2.4 |
| **Sex** | | |
| Male | 146 | 58.4 |
| Female | 104 | 41.6 |
| **Area of residence** | | |
| Rural | 247 | 98.8 |
| Semi-urban | 3 | 1.2 |
| **Educational status** | | |
| Illiterate | 94 | 37.6 |
| Upto primary | 69 | 27.6 |
| Upto matric | 53 | 21.2 |
| Intermediate & above | 34 | 13.6 |
| **Occupation** | | |
| Agriculture | 228 | 91.2 |
| Business | 18 | 7.2 |
| Govt servant | 4 | 1.6 |

**Table 2: Awareness of respondents about dengue fever transmission**

| Awareness about dengue fever transmission | Frequency | Percentage |
|---|---|---|
| **Spread by housefly** | | |
| Yes | 5 | 2.0 |
| No | 216 | 86.4 |
| Don't know | 29 | 11.6 |
| **Spread by mosquito** | | |
| Yes | 237 | 94.8 |
| No | 3 | 1.2 |
| Don't know | 10 | 4.0 |
| **Spread by food sharing** | | |
| Yes | 4 | 1.6 |
| No | 180 | 72.0 |
| Don't know | 66 | 26.4 |
| **Spread by human contact** | | |
| Yes | 5 | 2.0 |
| No | 185 | 74.0 |
| Don't know | 60 | 24.0 |
| **Source of information** | | |
| Television | 194 | 77.6 |
| Radio | 37 | 14.8 |
| Newspaper | 4 | 1.6 |

| | | |
|---|---|---|
| Internet | 8 | 3.2 |
| No response | 7 | 2.8 |

**Table 3: Knowledge of respondents about different characteristics of dengue fever**

| Knowledge about different characteristics of dengue fever | Frequency | Percentage |
|---|---|---|
| **Peak time of mosquito bite** | | |
| **Sunrise** | | |
| Yes | 194 | 77.6 |
| No | 5 | 2.0 |
| Don't know | 51 | 20.4 |
| **Sunset** | | |
| Yes | 208 | 83.2 |
| No | 6 | 2.4 |
| Don't know | 36 | 14.4 |
| **Daytime** | | |
| Yes | 6 | 2.4 |
| No | 127 | 50.8 |
| Don't know | 117 | 46.8 |
| **Night time** | | |
| Yes | 16 | 6.4 |
| No | 132 | 52.8 |
| Don't know | 102 | 40.8 |
| **All time ( round the clock )** | | |
| Yes | 1 | 0.4 |
| No | 133 | 53.2 |
| Don't know | 116 | 46.4 |
| **Symptoms of dengue fever** | | |
| **Fever** | | |
| Yes | 154 | 62.8 |
| No | 4 | 1.6 |
| Don't know | 89 | 35.6 |
| **Chills** | | |
| Yes | 150 | 60.0 |
| No | 3 | 1.2 |
| Don't know | 97 | 38.8 |
| **Rash** | | |
| Yes | 149 | 59.6 |
| No | 1 | 0.4 |
| Don't know | 100 | 40.0 |
| **Muscular/ bone pains** | | |
| Yes | 123 | 49.2 |
| No | 1 | 0.4 |
| Don't know | 126 | 50.4 |

| | | |
|---|---|---|
| **Bleeding** | | |
| Yes | 135 | 54.0 |
| No | 2 | 0.8 |
| Don't know | 113 | 45.2 |
| **Eye pains** | | |
| Yes | 145 | 58.0 |
| No | 3 | 1.2 |
| Don't know | 102 | 40.8 |
| **All above symptoms** | | |
| Yes | 179 | 71.6 |
| No | 13 | 5.2 |
| Don't know | 58 | 23.2 |
| **Dengue treatment** | | |
| **General practitioners** | | |
| Yes | 30 | 12.0 |
| No | 220 | 88.0 |
| **Hospitals** | | |
| Yes | 213 | 85.2 |
| No | 37 | 14.8 |
| **Hakeem/homeo physicians** | | |
| Yes | 15 | 6.0 |
| No | 235 | 94.0 |
| **Self-medication** | | |
| Yes | 2 | 0.8 |
| No | 248 | 99.2 |
| **Quacks** | | |
| Yes | 4 | 1.6 |
| No | 246 | 98.4 |

**Table 4: Knowledge of respondents about favorable mosquito breeding sites**

| Favorable breeding sites | Frequency | Percentage |
|---|---|---|
| **Need water for breeding** | | |
| Yes | 100 | 40.0 |
| No | 117 | 46.8 |
| Don't know | 33 | 13.2 |
| **Clean stagnant water** | | |
| Yes | 154 | 61.6 |
| No | 4 | 1.6 |
| Don't know | 92 | 36.8 |
| **Dirty stagnant water** | | |
| Yes | 31 | 12.4 |
| No | 140 | 56.0 |
| Don't know | 79 | 31.6 |
| **Rainwater** | | |
| Yes | 135 | 54.0 |
| No | 3 | 1.2 |
| Don't know | 112 | 44.8 |

| | | |
|---|---|---|
| **Garbage collection** | | |
| Yes | 120 | 48.0 |
| No | 5 | 2.0 |
| Don't know | 125 | 50.0 |
| **Tyres** | | |
| Yes | 151 | 60.4 |
| No | 6 | 2.4 |
| Don't know | 93 | 37.2 |
| **Flower pots** | | |
| Yes | 129 | 51.6 |
| No | 1 | 0.4 |
| Don't know | 120 | 48.0 |
| **Air cooler** | | |
| Yes | 160 | 64.0 |
| No | 1 | 0.4 |
| Don't know | 89 | 35.6 |
| **Water ponds** | | |
| Yes | 160 | 64.0 |
| No | 2 | 0.8 |
| Don't know | 88 | 35.2 |

**Table 5: Practices of respondents for preventing mosquito bites**

| Preventive practices for mosquito bites | Frequency | Percentage |
|---|---|---|
| **Using bed nets** | | |
| Yes | 153 | 61.2 |
| No | 65 | 26.0 |
| Don't know | 32 | 12.8 |
| **Using coils and mats** | | |
| Yes | 167 | 66.8 |
| No | 83 | 33.2 |
| **Applying repellents** | | |
| Yes | 161 | 64.4 |
| No | 89 | 35.6 |
| **Using fans** | | |
| Yes | 28 | 11.2 |
| No | 134 | 53.6 |
| Don't know | 88 | 35.2 |
| **Installing window screens** | | |
| Yes | 179 | 71.6 |
| No | 1 | 0.4 |
| Don't know | 70 | 28.0 |
| **Insecticide spray** | | |
| Yes | 155 | 62.0 |
| No | 3 | 1.2 |
| Don't know | 92 | 36.8 |

| | | |
|---|---|---|
| **Drainage of stagnant water** | | |
| Yes | 160 | 64.0 |
| No | 90 | 36.0 |
| **Covering store water** | | |
| Yes | 173 | 69.2 |
| No | 77 | 30.8 |
| **Disposing of old tyres** | | |
| Yes | 141 | 56.4 |
| No | 109 | 43.6 |
| **Maintaining cleanliness** | | |
| Yes | 146 | 58.4 |
| No | 104 | 41.6 |

**Table 6: Comparison of demographic variables of respondents and knowledge about dengue fever**

| **Age (years)** | **Source of information** | | | | | |
|---|---|---|---|---|---|---|
| | **TV** | **Radio** | **Newspaper** | **Internet** | **No response** | **Statistical Significance** |
| **<25** | **26(70.3%)** | **7(18.9%)** | **3(8.1%)** | **1(2.7%)** | **0(0%)** | **P<0.05** |
| **25-39** | **83(78.3%)** | **13(12.3%)** | **0(0%)** | **7(6.6%)** | **3(2.8%)** | |
| **40-54** | **60(77.9%)** | **14(18.2%)** | **1(1.3%)** | **0(0%)** | **2(2.6%)** | |
| **55-69** | **20(83.4%)** | **2(8.3%)** | **0(0%)** | **0(0%)** | **2(8.3%)** | |
| **70 and above** | **5(83.3%)** | **1(16.7%)** | **0(0%)** | **0(0%)** | **0(0%)** | |
| **Education** | **Knowledge about peak time of mosquito bite** | | | | | |
| | **Yes** | **No** | **Don't know** | | | |
| **Illiterate** | **84(89.4%)** | **0(0%)** | **10(10.6%)** | | | **P<0.05** |
| **Up to primary** | **44(63.8%)** | **0(0%)** | **25(36.2%)** | | | |
| **Up to matric** | **40(75.5%)** | **5(9.4%)** | **8(15.1%)** | | | |
| **Intermediate and above** | **26(76.5%)** | **0(0%)** | **8(23.5%)** | | | |
| **Education** | **Knowledge about clean stagnant water favorable for mosquito breeding** | | | | | |
| **Illiterate** | **24(25.5%)** | **1(1.1%)** | **69(73.4%)** | | | **P<0.05** |
| **Up to primary** | **56(81.2%)** | **1(1.4%)** | **12(17.5%)** | | | |
| **Up to matric** | **45(84.9%)** | **1(1.9%)** | **7(13.2%)** | | | |
| **Intermediate and above** | **29(85.3%)** | **1(2.9%)** | **4(11.8%)** | | | |

## DISCUSSION

The present study was carried out to assess the knowledge of households about the dengue fever in Union Council Wang District Rajanpur. A total number of 250 respondents were included in this study. The study revealed that majority (73.2%) of the respondents were 25-54 years old while remaining proportion was less than 25 and more than 54 years old. It is quite understandable as this is the age group who is more likely to expose to mosquitoes especially at the places of their job, 58.4% respondents were males and 41.6% were females. This is in contrast to the finding of the study, conducted by Koenraadt et al. who reported that 82% of the respondents were females.[5] The reason of this discrepancy might be due to the different social background of the two study sites. In the present study, the majority of women were reluctant to communicate with the researcher as it is usually forbidden in this conservative society.

The role of education cannot be ignored to improve the lifestyle and to adopt safety measures among the community. The study showed that a major proportion (48.8%) of the respondents had education primary to matric and 37.6% respondents were illiterate. The majority of the respondents (91.2%) belonged to a rural community and were engaged in agricultural activities. The findings of our study are comparable with an another study which showed that majority (65.0%) of the respondents were farmers.[5]

It was encouraging that a major portion (94.8%) of the respondents had knowledge that dengue fever spread by mosquitoes. In this regard, media played a significant role to provide information to the study population. Among these respondents, the majority (77.6%) obtained information about dengue from television. The results of our study exhibited better scenario than the study conducted by Acharya and coworkers who asserted that majority (59.0%) of the respondent got information about dengue from television.[6] The reason for this might be that the target area for this study was semi-urban and almost all households got the facility of TV. Moreover, people generally believe that the information provided from this media was authentic.

Dissemination of adequate information about preventive measures against dengue can prevent the population from its hazards. It is worth-mentioning here that 77.6% and 83.2% respondents had ample knowledge that peak times of mosquitoes bite was sunrise and sunset respectively. The results of this study are better than the study conducted by Koenraadt et al. who asserted that 67.0% respondents had an idea that dengue vectors bite during the day.[5] Major proportion (85.2%) was aware of dengue and had firm belief that hospitals are the best places for the dengue treatment while 6.0%, 0.8% and 1.6% respondents preferred hakeem/homeo physicians, self-medication and quacks respectively. Among the respondents, 12.0% believed that general practitioners are more reliable for dengue treatment. The findings of the study conducted by Nalongsack and colleagues are better than our study results who stated that 96.5% respondents were aware they should visit a doctor when they suffer from dengue.[1]

It is apparent from the study that there is further need to enhance knowledge of population because 61.6% and 54.0% respondents considered clean stagnant water and rain water respectively favored dengue mosquitoes breeding Study revealed that 48.0% respondents were aware that garbage collection is the potential breeding sites for dengue mosquitoes. The majority of the respondents knew that tyres, flower pots, air-coolers and water ponds are potential breeding sites for dengue mosquitoes. It is encouraging that majority of respondents adopted safety measures to prevent mosquito's bites. Out of these respondents, 61.2% used bed nets, 66.8% used coils & mats and 64.4% applied repellents in their homes. The study was done by Koenraadt et al. also asserted numerous methods adopted by respondents. Among them, 18.0% used mosquito nets, 17.0% turned containers upside down, 29.0% changed stored water frequently and 16.0% sprayed insecticide in their homes.[5]

The study showed that 60.0% respondents used insecticide spray for the prevention of mosquito biting. The results of our study are better than the study conducted by Itrat and collaborators who stated that use of anti-mosquito spray was the most prevalent (48.1%) preventive measure.[4]

## CONCLUSION

It was concluded from the study that in spite of being not highly educated most of the respondents had good knowledge about dengue fever, its transmission, the peak time of mosquito bite, signs & symptoms of dengue fever and treatment. They had good knowledge and awareness about the potential breeding sites of the dengue and most of them had enough knowledge about the protection from a mosquito bite. They had gained this knowledge through mass media especially from television. Most of them stored water in the houses and ignorant about the importance of covering the container and pots. The study revealed that the studied population needs health education about dengue fever, vector responsible for transmission, its bionomics etc.

## RECOMMENDATIONS

- The ignorant behavior of the population about covering the containers, sanitation and hygiene should be changed by involving community leaders like Imam Mosques and school teachers.
- Health education, Training and seminars about dengue control and prevention should be imparted to health personnel like Medical Officers, LHWs and others, who are in direct contact with the community. Mass media especially TV, radio and print like newspapers should be involved in the campaign against dengue.

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Original Article

# Mean Time to Union of Open Tibial Fractures after using Autogenous Bone Graft as Primary Procedure

Khalid Mahmood, Farooq Azam, Waqas Ali, Syed Saqib Raza

**ABSTRACT**

**Objective:** To determine mean time to union of open tibial fractures after using autogenous bone graft as a primary procedure.

**Methodology**: It was a Descriptive study conducted in the Emergency unit of orthopaedics department, Jinnah Hospital Lahore. Study duration was six months. Eighty patients fulfilling the inclusion criteria were included in this study. Non-probability, purposive sampling was used.

**Results:** Out of 80 patients, 75(94%) patients had good results in terms of soft tissue healing and fracture union. Thirty three patients had union time of 28 weeks and 13(16%) had union time of 27 weeks while union time ranged between 25-40 weeks with mean time to union of 28.55 weeks.

**Conclusion:** Primary autogenous bone graft is a simple and effective method to achieve union in primarily applied external fixators in open tibial fractures in properly selected patients.

**Keywords:** *Autogenous bone graft. External fixator. Open fractures. Union.*

## INTRODUCTION

A fracture in which there is a communication of the fracture with the external environment is termed as an open fracture. Gustilo and Anderson classified open fractures into three main types on the basis of the personality of fracture, the condition of the soft tissue and its vascular status. The treatment of open fractures of the tibial shaft of the tibia is still controversial.[1] These fractures also have adverse economical implications.[2] Although general principles of aggressive debridement, stabilization, antibiotics, adequate soft tissue coverage and early bone grafting are accepted, but still there is no standard method of stabilization of type II and type III fractures. Initial management with external stabilization is well established since it allows immediate stabilization with wound access for management of soft tissues.[3] Bony stabilization can be achieved in a variety of methods such as plates and screws, external fixation with and without bone grafting and with intramedullary nails.[4] Each of these modalities has inherent complications associated with the specific method of stabilization.[5] External fixation of fractures with severe soft tissue injury has been standard treatment during 1980's.[6] External fixation has been associated with many complications including wound problems, deep infections hardware failures, pin track infections, pin track loosening, malunion, non-unions and delayed union.[7]

The best technique of fracture stabilization depends on the anatomic location of the fracture and characteristics of the injury.[8]

The best technique of fracture stabilization depends on the anatomic location of the fracture and characteristics of the injury.[8]

In the case of a subcutaneous bone as the tibia, the status of soft tissue envelope is the single most important factor influencing the outcome and aiming for the earliest debridement minimizes the infection.[9] External fixators are available in emergency department and provided to the patient free of cost. Cancellous bone grafting has been a standard way of inducing osteogenesis at the fracture site.[10] The conventional way of treating the open fractures of the tibia by applying external fixator for soft tissue healing and then removing the fixator and after a certain period of time performing another surgery for definitive fixation has a mean time to union of 32 $\pm$ 9.5 weeks.[11] Early bone grafting at 6 to 8 weeks post injury is well accepted as a method to increase the union rate and shorten the union time.[12] Long term morbidity of patients can be minimized using primarily autogenous bone graft at primary surgery.[13] We attempted to achieve enhanced union in lesser time and saved the patient from multiple surgeries by adding an autogenous cancellous

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*Received: August 16, 2015; Accepted: October 07, 2015.*

bone graft to the fracture site at the time of emergency stabilization of fracture with the external fixator.

## METHODOLOGY

It was a descriptive study carried out in the emergency unit of orthopaedics department Jinnah Hospital Lahore. Study duration was six months. Eighty patients fulfilling the inclusion criteria were included.

**Inclusion Criteria**

1. Age 18-65 years
2. Both genders
3. Open tibial fractures Gustilo type II, IIIA, IIIB
4. Patient presenting within 24 hours of injury

**Exclusion Criteria**

1. Patient with circumferential bone loss (radiological diagnosis)
2. Patient with vascular injury (clinical diagnosis)
3. Polytrauma patients (multiple fractures on x- ray)
4. Patient having previously infected bone (clinical and radiological)
5. Patient with pathological fracture (clinical and radiological)

The study was approval from ethical committee of the hospital and 80 patients presenting in the surgical emergency of Jinnah Hospital Lahore with open tibial fractures fulfilling the inclusion criteria were selected. Informed written consent from the patients was taken. The patients were operated by the consultant. External fixator was applied to each patient and at the same time, the cancellous bone graft was taken from the anterior superior iliac crest and was crushed into pieces all less than 5mm in size and was packed with plane forceps tightly at the fracture site. Patients were examined clinically and radiologically at follow-up visits after 4 weeks to evaluate the progression of the union.
Data was analyzed by SPSS 21. The mean and standard deviation was calculated for age. Frequency and percentages were calculated for gender, fracture type and results of surgery. Outcome of surgery were judged in terms of mean time to union.

## RESULTS

The study included 80 patients. The mean age of the patients included in this study was 36±8.7 (mean± standard deviation), with the youngest patient being 19 years and the oldest patient being 55 years old (Table 1).

In the gender distribution, 73(91%) patients were male and 7(9%) were females (Figure 1).

**Table 1: Showing age of the patients included in this study**

| Age of the patients in years | | |
|---|---|---|
| Minimum | Maximum | Mean ± Standard Deviation |
| 19 | 55 | 36 ± 8.7 |

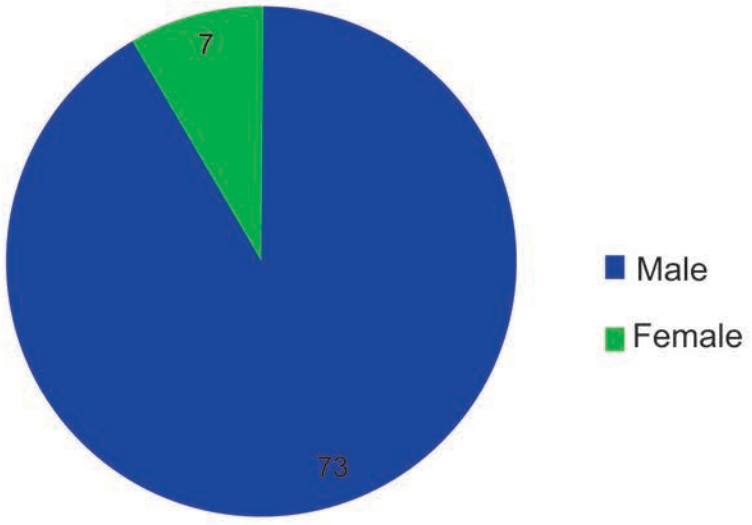


**Figure 1: Showing gender distribution**

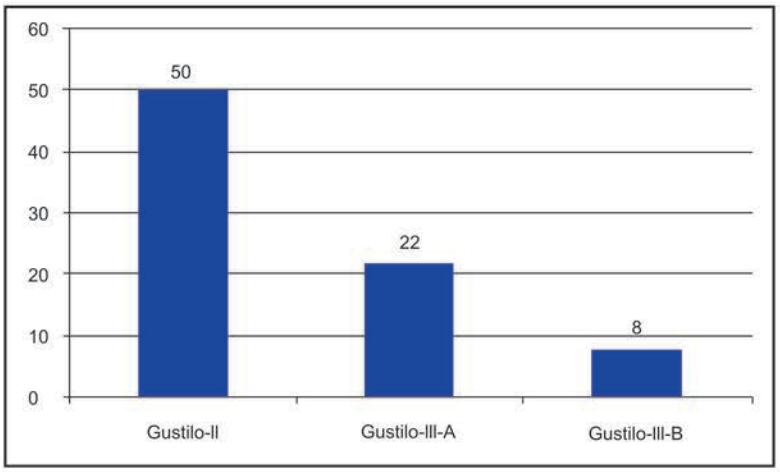


**Figure 2: Showing types of fracture of the study subject**

**Table 2: Showing Mean time to union of the fracture**

| Mean time to union of the fracture. | | |
|---|---|---|
| Minimum Time | Maximum Time | Mean ± Standard Deviation |
| 25 | 40 | 28.55 ± 2.05 |

Regarding type of fracture, 50(63%) patients sustained Gustilo type II open tibial fractures, 22(28%) sustained type IIIA and 8 (10%) sustained open gustilo type IIIB fractures (Figure 2).

Seventy five (94%) patients had good outcomes of surgery in terms of soft tissue healing and union of fracture. Out of 80 patients, 33(42%) had union time of 28 weeks and 13(16%) had union time of 27 weeks while union time ranged between 25-40 weeks with mean time to union of 28.55 weeks (Table 2).

## DISCUSSION

The goal of the open tibial fracture treatment is to obtain a functionally and anatomically normal limb with the return of the patient to their preinjury level. The study shows that common trauma victims were males (91%). Comparable results were seen in a study conducted by Tabatabai and Hosseini.[4]

The high rate of complications observed in open tibial fractures has been documented in another study.[14] The choice of fixation affects significantly the outcome of such injuries. Another study conducted on tibial fracture showed a 20-30% incidence of non-union and chronic infection among type III fractures treated with fixation.[15] Experience with the external fixators in open fractures shows favorable union rate approaching 100% but an incidence of chronic infection of 10-20%.[16] The problem of non-union associated with the external fixator can be overcome by using autogenous cancellous bone graft.[17]

In this study we found out of 80 patients, 75(94%) had good results and only 5(6%) patients had an infection. Cancellous bone graft has been a gold standard in inducing osteogenesis at the fracture site. Numerous authors agreed on the advantage of early autogenous bone grafting.[18] A study was conducted on the results achieved in patients with type III open tibial fractures who underwent primary autogenous bone grafting at the time of debridement and skeletal stabilization. According to that study between 1996 and 1999 twenty patients with a mean age of 35.8 years were operated. Out of these 20 type III fractures, eight were type A, 11 were type B and 1 was type C. Wound debridement, external fixation and autogenous bone grafting with bone coverage were done. The mean value of follow-up period was 46 months (range 34-55). The fixator was removed after a mean time of 21 weeks (range 14-35) with a mean union time of 28 weeks (range 19-45).[19] Similarly, in the present study union time was 28.55 weeks using primary bone graft.

It was concluded in a study conducted in India that it is more vital to attain fracture union than soft-tissue coverage in case of open fractures.[20] So, in open tibial fractures of type III wound debridement and cleansing followed by bone grafting with external fixator within 24 hours, decreases infection rate and shortens union time.

## CONCLUSION

This study concluded that autogenous bone grafting is an effective method of enhancing union in open tibial fractures when used with an external fixator.

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Original Article

# Breast Reduction: Combination is Best

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**ABSTRACT**

**Objective:** In this prospective study, we describe our experience of breast reduction with combine three techniques approach, aimed at addressing three different aspects of breast reduction: skin reduction, shaping and nipple areolar complex shaping.

**Methodology:** We assessed the outcome of 20 consecutive cases perioperative and postoperatively (for a mean of 12 months) in women who underwent breast reduction surgery involving a combination of three techniques: "inverted T" skin reduction, modified Hall-Findley supero medial pedicle for glandular reduction, and inferior de-epithelialized flap (modified "Foustanos" flap) for molding and improved shaping of the breast. The final bra cup size was C or D in all patients.

**Results:** The overall results were graded as excellent in eight patients and very good in twelve patients. Each patient was completely satisfied with her surgery. Twelve patients developed venous congestion of the nipple areolar complex, which resolved within 24 - 48 hours after surgery. Four patients had uneventful delayed wound healing in the vertical scar of the inverted T pattern. Nipple-areolar complex survival rate was 100%. No patient had a major adverse event, permanently altered nipple areolar complex sensitivity, or bottoming out of the lower pole. None required revision surgery.

**Conclusion:** This study confirms our expectations that a single procedure with a combination of different techniques is both effective and safe.

**Keywords:** *Breast reduction. Combination of techniques. Skin reduction. Gland reduction. "Foustanos" flap. Nipple areolar complex shaping.*

## INTRODUCTION

As the fifth most common reconstructive procedure, breast reduction is among the most frequent operations in the western world and day by day the frequency of this procedure is increasing in Pakistan also.[1] Since the majority of patients seeking breast reduction have a bra cup size of at least DD, several questions about the technical aspects of the surgery still require a definitive answer.[2] Questions remain regarding which skin pattern incision to perform, which nipple areolar complex (NAC)-transposing pedicle to choose, and which technique is the best way to mold and maintain a conical breast shape.[3-5] Effectively modulating these three elements is the key to a surgical result that is successful and gratifying for both the patient and the surgeon. We herein report our experience with 20 consecutive patients undergoing breast reduction surgery involving a combination of three techniques: an "inverted T" skin reduction pattern, a modified Hall-Findley superomedial pedicle for glandular reduction, and an inferior de-epithelialized flap (modified "Foustanos" flap) for molding and improved shaping of the breast.[6-1]

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*Received: September 10, 2015; Accepted: November 20, 2015.*

## METHODOLOGY

According to the principles of breast reduction using a combination of three techniques (described below), was performed by a single surgeon in 20 consecutive patients from April 2014 to June 2015. The mean followup period was 10 months (range, 5 to 19 months). The patient's mean age was 39.5 years (range, 18 to 65 years) and mean body mass index was 24 kg/m2 (range, 19 to 37.5 kg/m2). No patient had hypertension, diabetes, or any other major medical disorder. Each patient had a bra cup size of DD or larger. The NAC of each patient was within 10 cm of the sternal notch. Twelve patients (60%) over 40 years old underwent mammography preoperatively.

**Figure 1.** (a) anterior; (b) oblique; (c) lateral views of a patient preoperatively (left column) and postoperatively (right column). Each patient received 2 g Ceftriaxone intravenously, 1 hour before surgery. The mean length of surgery was 240 minutes (range, 210 - 285 minutes). The mean quantity of breast tissue resected was 355 g (range, 210 - 455 g) on the left and 370 g (range, 205 - 470 g) on the right. All resected tissue was sent to the pathology laboratory for examination. A closed Redivac suction drain was placed in each breast intraoperatively and subsequently removed at a mean of 4 days postoperatively (range, 3 to 9 days), when drainage was below 30 mL/day. Every patient received a course of postoperative antibiotics,

including oral co-amoxiclav and ceftriaxone until the drains were removed. All patients were discharged to home on the first postoperative day. They underwent follow-up examinations on a weekly basis for 4 consecutive weeks after surgery, followed by repeat examinations at 6 and 12 months postoperatively.

Each patient underwent breast skin reduction according to the "inverted T" pattern technique. After the Biesenberger maneuver with respect to the breast, meridian was performed, the gland pillars were 6 - 7 cm long (measured from the inframammary fold to the areolar border) and the keyhole was 6 cm wide by 4 cm long. The new areola had a diameter of 4 - 5 cm. The gland size was reduced, sparing a 7 cm wide inferior de-epithelialized flap, which was fully disengaged from the inferior margin of the horizontal inframammary incision. This inferior flap was at least 2 cm thick. The deepening incisions into the gland pillars were rigorously maintained at 1 cm from the skin, leaving at least 1 cm of the de-epithelialized dermis. The NAC was transposed to the keyhole using a superomedial Hall-Findley pedicle (**Figure 2**), modified by a wider medial undermining above the pectoral fascia, to provide space for the inferior disengaged flap. The latter was secured to the clavi-pectoral fascia and subjacent major pectoralis muscle with three superior stitches using nonabsorbable prolene 0 suture. We preferred to keep the NAC transposing pedicle thickness at 15 mm and to indent it at the medial-proximal side, to facilitate its final rotation and insertion. Monocryl 3/0 sutures were used for NAC insetting at the keyhole site and for the approximation of the glandular pillars. Prolene 4/0 sutures were used for skin closure. Study was approved by Hospital Ethics Committee and informed consent was taken from all the patients.

## RESULTS

Each patient underwent regular follow-up. The final bra cup size ranged between C and D. The efficacy of the surgery was evaluated by an independent plastic surgeon and trained nurse, based on breast symmetry and overall aesthetic appearance, with particular

**Figure 1 (a): Pre-operative Anterior View**

**Figure 1 (a): Post-operative Anterior View**

**Figure 1(b): Pre-operative Oblique View**

**Figure 1(b): Post-operative Oblique View**

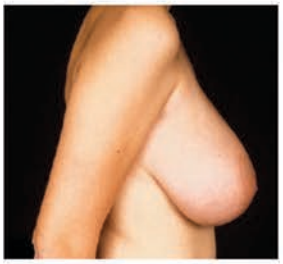

**Figure 1(c): Pre-operative Lateral View**

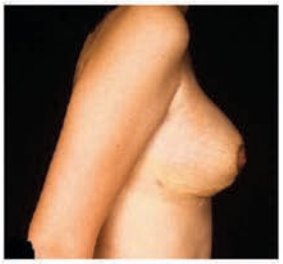

**Figure 1(c) Post-operative Lateral View**

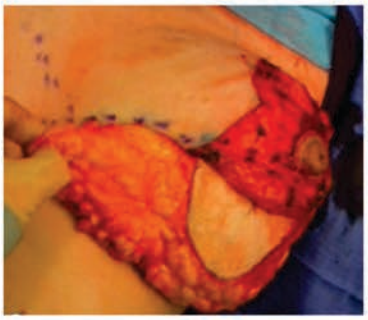

**Figure 2 : NAC Transposition for final inset**

emphasis on the degree of conization and fullness of the upper pole of the breast.The results were graded on a 4-point scale (excellent, very good, good, or poor) as excellent for eight patients (40%) and very good for twelve patients (60%). Each patient was completely satisfied with the surgical results and indicated that she would recommend the surgery to other possible candidates. Twelve patients (60%) developed venous congestion of the NAC, which resolved in the first 24 - 48 hours after surgery. Four patients (20%) had uneventful delayed wound healing in the vertical scar of the inverted T pattern. No patient had a major adverse event or complication, such as a hematoma, seroma, infection, or partial or full NAC necrosis. There was a 100% survival rate of the NAC. No patient had permanently altered NAC sensitivity or bottoming out of the lower pole. No patient required revision surgery.

## DISCUSSION

The continuing controversy regarding the most effective and safest technique for breast reduction has led to many discussions and the development of many different approaches among plastic surgeons in the last few decades.[4,10,12,13] The absence of definitive conclusions underscores the lack of consensus regarding a single superior approach for breast reduction. This case series describes our experience with the combined use of three previously reported techniques aimed at three different aspects of breast reduction: skin reduction, shaping and NAC transposing flap.[12-13] Skin reduction using the classic "inverted T" approach was ideal for our group of patients, as it closely followed the shape molded by the mobilized deep flap.[6] Furthermore, we left 1 cm of de-epithelialized skin along the cut skin edge of the entire inverted T pattern, which limited the risk of skin dehiscence due to moderate suture stretch after compression of the "Ribeiro- Foustanos" inferior flap from behind. In addition to carrying the NAC to the new keyhole, mobilization of the gland structures is integral for generating the ideal conical shape of the new breast. For "conization" of the gland, we did not rely solely upon the superomedial pedicle, as we do not think that it is possible to maintain a durable conical shape with this pedicle alone. Instead, we undermined a wide pocket on the pectoral fascia, preserving the medial border of the gland and its blood supply for the pedicle. This is the pocket into which the associated inferior flap was inset. [14,15] A superomedial pedicle was used to transpose the NAC to the new keyhole, as it is reliably associated with NAC survival.[14] This allowed us to excise a full crescent of gland at the medial and uppermost side of the pedicle to facilitate in setting the NAC at the new keyhole. For the inferior-based de-epithelialized flap, we chose a 7 cm wide flap centered on the breast meridian, which was completely disengaged and untethered from the inframammary fold. Its vascular supply, arising from the fourth intercostal artery, was always resilient enough to allow the flap to be moved upward to counteract the flatness of the breast usually seen after a reduction, even when the Hall-Findley technique is used. Our herein described approach to breast reduction was associated with a high frequency of venous stasis of the NAC, although this fully resolved within 48 hours in all patients. The transient venous stasis may have been caused by the sudden increase in pressure applied to the inferior flap on the undersurface of the superomedial pedicle. Recovery of the NAC circulation may be easier and faster if a finger is used to "smooth" and "comb" any unevenness of the deep surface of the pedicle after juxtaposing the pedicle and inferior flap, but before placing the vertical sutures of the glandular pillars.

## CONCLUSION

The experience collected with this small series of patients confirms our expectations that the solution to questions about breast reduction may depend on the melding of different procedures into a single one, instead of relying on merely a single technique. The use of a combination of techniques may be applicable to other types of surgery as well. This small series does not pretend to be a state of the art conclusion about the best

method possible to approach breast reduction. This is either because of the small number of patients involved or because of the lack of any statistical issue carried out with comparable cohorts of patients assigned to each procedure that in this study are mixed up. Not with standing it could warrant future and more articulated trials.

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Original Article

# The Diagnostic Yield of Colonoscopy Among 114 Patients Presenting with Bleeding Per Rectum for Early Detection of Colorectal Cancer: An Audit of Multicenter Trial

Sidra Dil Muhammad, Muhammad Saad Faisal, Amjad Saeed Mian, Muhammad Adnan Khan, Saadia Javid, Moeen Yaseen

**ABSTRACT**

**Objective:** To study the diagnostic yield of colonoscopy in patients presenting with bleeding per rectum for early detection of colorectal cancer.

**Methodology:** A total of 114 patients of both genders, age between 20 – 80 years and having a history of bleeding per rectum were included. The study was conducted from May 2013 to June 2015. Patients having a recent history of abdominopelvic trauma, bleeding disorders and acute anal fissure were excluded from the study. Selected patients underwent digital rectal examination, proctoscopy and colonoscopy and diagnosed for underlying pathology. Any suspicious lesion, detected on examination, was biopsied for confirmation of diagnosis.

**Results:** The mean age of patients in our study was 47.57 ± 1.2 years. Out of 114 patients, 55 (48.2%) were male and 59 (51.8%) were females. The mean duration of bleeding per rectum was 7.11 ± 4.5 weeks. Malignancy suspected on clinical examination was confirmed on histopathology as colorectal cancer in 16 (14.03%) patients. Curative treatment was offered to all diagnosed colorectal cancer patients after staging of malignancy.

**Conclusion:** Being the earliest symptom of colorectal carcinoma, the bleeding per rectum facilities in the detection of colorectal cancer at an early stage and restores better prognosis.

**Keywords:** *Bleeding per rectum. Colorectal carcinom. Hemorrhoids.*

## INTRODUCTION

Colorectal cancer (CRC) is the 2nd most common cause of cancer-related death in the United States.[1] It accounts for over 9% of all cancer incidence.[2] CRC is a chief cause of cancer mortality.[3] Around 2—25% of patient with the disease already have metastasis at the time of diagnosis.[4] In Pakistan, the latest study shows that 8% of patients presenting with bleeding per rectum (PR) harbor colorectal carcinoma.[5]

Colorectal cancer is generally classified into proximal colonic, distal colonic and rectal cancer.[6] It most commonly occurs sporadically and is inherited in only 5% of the cases. This cancer is determined mainly by environmental exposure.[7] Diet, high in fat and sugar, is the most important etiological factor of CRC.[8] Modifiable behavioral risk factors comprise exercise, obesity and smoking.[9] Common symptom of CRC include alteration in bowel habit, bleeding per rectum (PR), weight loss, abdominal pain, intestinal obstruction and changes in the caliber/shape of stool.[10] Rectal bleeding is a very common clinical symptom.[11] Bleeding PR denotes to lower gastrointestinal bleed which arises distal to the ligament of Treitz.[12] Hemorrhoids are the most common cause of bleeding PR; other causes include anal fissure, inflammatory bowel disease, colorectal malignancy, infections and radiation therapy.[13] Rectal bleeding is a recognized early symptom of colorectal cancer.[14] Bowel cancer patients presenting with rectal bleeding have earlier stage disease and significantly better survival than patients presenting with a change in bowel habit or abdominal pain.[15] Astin et al. have reported that colorectal cancer is present in 2.2 to 16% of patients with bleeding PR.[16]

Colonoscopy is not a routine in every patient presenting with PR bleeding. Barium enema examination accurately identifies late stage cancer, but it is a poor test for important cancer precursor lesions.[17] The staging of the tumor is principally done by endoscopic ultrasound and CT scan of chest and abdomen.[18] Regarding the treatment of CRC, surgery is the definitive treatment modality with the support of the adjuvant, neo-adjuvant chemotherapy. However, treatment depends on the stage of the disease.[19] The prognosis of the patient with metastatic disease is poor.[20]

Bleeding PR is one of the commonest problems presenting in surgical OPD in Pakistan. Most of these patients have previously been considered and treated for hemorrhoids, without proper physical examination (DRE, proctoscopy and Colonoscopy) by the hakims, quakes and general practitioners. Due to this the patients who actually harbor CRC, stay undiagnosed

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*Received: October 20, 2015; Accepted: November 15, 2015.*

for a longer time and later present with an advanced and unresectable tumor. If these patients undergo an appropriate physical examination and investigation of their bleeding PR, their malignancy would have been picked up at an early stage, treated with curative intent and their chances of survival would have been significantly upgraded.

All studies on CRC from Pakistan have reported the percentage of various symptoms including bleeding PR but none has presented the burden of CRC in cases of bleeding PR, the aspect which will be covered by the current study. This study will help us to make recommendations regarding the proper clinical evaluation of CRC for early detection of CRC which is crucial for curative treatment of disease.

## METHODOLOGY

The study was conducted in General Surgery Departments of Sharif Medical City Hospital, Ittefaq Hospital and Rasheed Hospital, Lahore over a period of two years, from May 2013 to June 2015. The study was approved from the ethical committee of the hospital. This cross-sectional study had a sample size of 114 cases with 95% confidence level, 5% margin of error and 8% expected percentage of colorectal carcinoma in patients who present with bleeding per rectum. Non-probability purposive sampling technique was used. The patients who presented in surgical outpatient departments of these hospitals with a complaint of bleeding per rectum, fulfilling inclusion and exclusion criteria were entered in this study.

### Inclusion Criteria

1. Both genders
2. History of bleeding per rectum.
3. Age 20 - 80 years

### Exclusion Criteria

1. A recent history of abdominopelvic trauma.
2. Patients with bleeding disorders, assessed by clotting time, bleeding time, prothrombin time, activated partial thromboplastin time and platelet count.
3. Patient having acute anal fissure because such patients will have severe pain on examination.
4. Patient not giving consent for physical participating in study exam.
5. Patient having the previous history of radiation and colorectal surgery.

Written Informed consent was taken from all selected patients and the patient were assured that their data would be kept confidential. The details of whole practice had been clearly explained to all patients with expected outcomes. Selected patients were admitted in general surgery ward. After taking a detailed history, patients underwent digital rectal examination (DRE), proctoscopy and colonoscopy in general operation theater electively after bowel preparation. Any suspicious lesion, detected during the examination, was biopsied for confirmation of diagnosis. Patient with the colorectal carcinoma was diagnosed on the basis of histological examination done in Pathology Department of the same hospitals by the different pathologist. The result would then be used to categorize the bleeding per rectum as positive (colorectal carcinoma) or negative (benign colorectal lesion). All the data of patients were collected and entered into SPSS version 21 computer program and analyzed accordingly.

## RESULTS

The mean age of patients in our study was 47.57 ± 1.2 years. Out of 114 cases, 55(48.2%) were male and 59(51.8%) were females. The mean duration of bleeding per rectum in our study was 7.11 ± 4.5 weeks with the minimum duration of 1 week and maximum duration of 19 weeks. Out of 114 cases, presenting with bleeding per rectum, 11(9.6%) were from 21-30 years age group, 31(27.2%) were from age group 31-40 years, 29(25.4%) were from age group 41-50 years, 24(21.0%) were from 51-60 years age group, 11(9.6%) were from 61-70 years age group and 8(7.2%) were from 71-80 years age group. None of these patients had past history of any lower gastrointestinal tract surgery. Out of the 11 patients presenting with bleeding per rectum in 21-30 years age group only 1 had detected colorectal carcinoma, in the age group 31-40 out of 31 only 3 had the detectable colorectal carcinoma, and in the age group 41-50 years out of 29 only 3 had detectable colorectal carcinoma. In age group 51-60 years out of 24 cases with bleeding per rectum only 5 had detectable colorectal carcinoma on histopathology, while in age group 61-70 years out of 11 cases only 3 were detected with colorectal carcinoma and in age group 71-80 years out of 8 cases presenting with bleeding per rectum only 1 was detected to be having colorectal carcinoma. The mean age of those patients in whom CRC detected was 51.56 ± 3.10 years. Only 6(5.26%) patients had a family history of colorectal malignancy. Pathologies identified on physical examination (DRE, proctoscopy and colonoscopy) and histopathological examination of the suspicious lesion are shown in table 1. Histological types and grading of CRC, and distribution of CRC according to Dukes staging are shown in table 2 and 3.

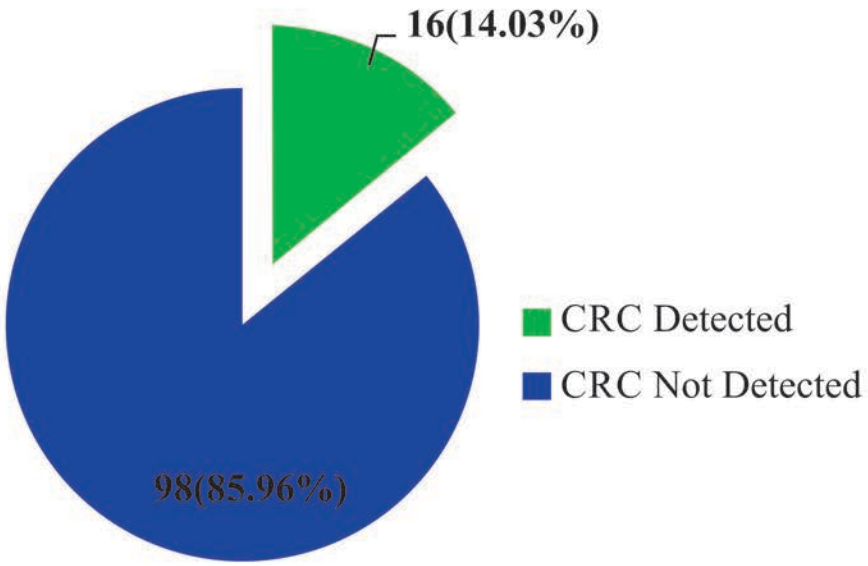


**Figure 1: Number of cases diagnosed as CRC**

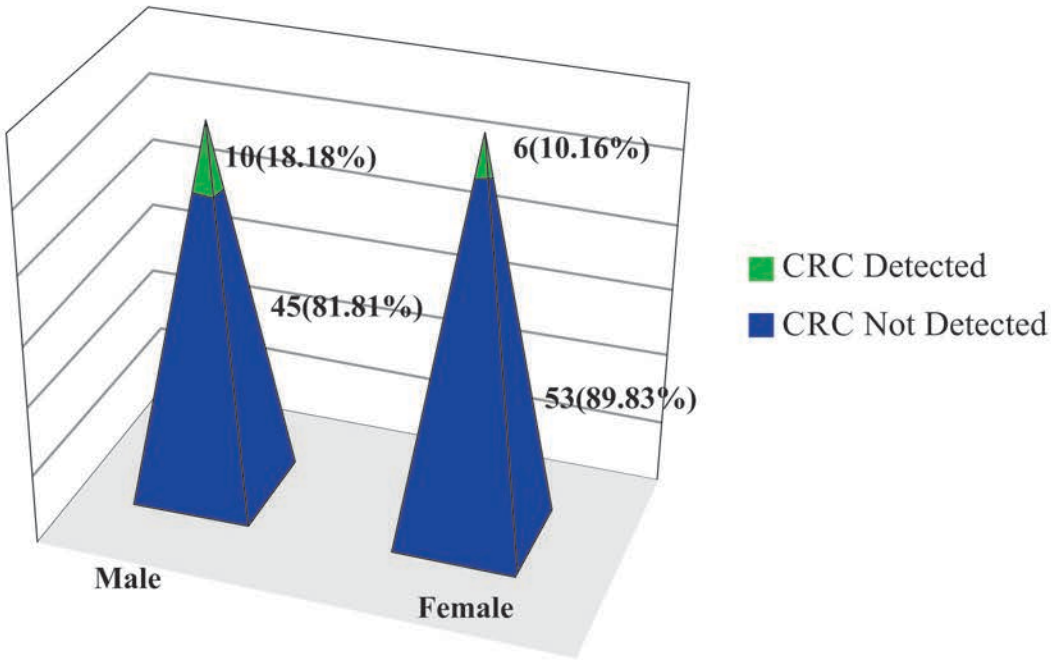


**Figure 2: Relation of gender of patients with detection of CRC**

**Table 1: Pathologies detected on physical assessment and histopathological analysis**

| Pathologies | No. of cases (n) | Percentage (%) |
|---|---|---|
| Colorectal cancer | 16 | 14.03 |
| Hemorrhoids | 70 | 61.04 |
| Ulcerative colitis | 1 | 0.87 |
| Rectal ulcer | 2 | 1.75 |
| Nonspecific colitis | 17 | 14.91 |
| Benign rectal polyp | 8 | 7.01 |

**Table 2: Histological types and grading of CRC**

| Histological types of CRC | Grades of tumor | | | | Total N (%) |
|---|---|---|---|---|---|
| | Grade 1 (Well differentiated) n (%) | Grade 2 (Moderately differentiated) n (%) | Grade 3 (Poorly differentiated) n (%) | Grade 4 (undifferentiated) n (%) | |
| Adenocarcinoma | 6(46.15%) | 3(23.07%) | 1(7.69%) | 3(23.07%) | 13(81.25%) |
| Squamous cell | 0 | 0 | 2(100%) | 0 | 2(12.5%) |
| Mucinous | 1(100%) | 0 | 0 | 0 | 1(6.25%) |

**Table 3: Distribution of CRC according to Dukes staging**

| Dukes classification | No. of cases (n) | Percentage (%) |
|---|---|---|
| A | 0 | 0 |
| B | 4 | 25 |
| C | 10 | 62.5 |
| D | 2 | 12.5 |

## DISCUSSION

The large intestine is the most frequent site for gastrointestinal cancer. Colorectal cancer is the third most common cancer in men and the second in women. The overall mortality is 8.5% of the total cases however it is high (52%) in the less developed countries for example Pakistan, reflecting a lesser survival, obviously due to late presentation, poor treatment options and affordability issues.[21,22] There is a paucity of population-based studies in Pakistan. However, a local study conducted by Ashraf et al. have shown that incidence of CRC was 25.4% in male and 20.1% in female.[23]

Although practiced in the modern world, CRC screening is not established in Pakistan. Unfortunately, quackery practices, poverty and lack of education had led the problem unrecognized. In these set up where there is no plan for screening for colorectal cancer exists, if a patient comes with rectal bleeding, he or she should be examined properly.

CRC presents earlier as PR bleeding. Studies from the western countries exhibited that the bleeding per rectum is the commonest presentation.[24,25] According to a study, conducted in Karachi, 62.05% patients were presented with PR bleeding.[26] Similar results, of bleeding per rectum as commonest presenting complaint were found in the study conducted by Guraya et al.[27] In our study, out of 114 patients presenting with rectal bleeding, colorectal cancer was detected in 16(14.03%). The leading cause of rectal bleeding was hemorrhoids (61.40%) followed by nonspecific colitis (14.91%). Other causes were benign rectal polyp (7.01%), rectal ulcer (1.75%) and ulcerative colitis (0.9%). Maximum cases of bleeding per rectum were observed in the age group 31 - 40 years (27.19%) but most colorectal cancer was detected in the age group 51 - 60 years (31.25%).

Small study size is unable to dictate the guidelines. However, larger prospective trials are justified to launch a solid relationship between rectal bleeding and colorectal cancer. An aggressive approach is essential to make early diagnosis and treatment, by keeping in mind the poor outcome of advanced CRC.

## CONCLUSION

Early endoscopic evaluation of patients with PR bleeding may be helpful in diagnosing CRC at an early stage and can lead to better prognosis.

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Original Article

# Frequency of Depression Among Primary Caregivers of Schizophrenic Patients

Saeed ur Rahman, Rubina Aslam

**ABSTRACT**

**Objective:** To determine the frequency of depression among primary caregivers of schizophrenic patients.

**Methodology:** This was a descriptive study (cross-sectional survey) including 150 primary caregivers of both sexes, of patients of schizophrenia. The place of this study was the outdoor clinic of Psychiatry Department, Jinnah Hospital Lahore. The study lasted for a duration of six months, from 5th August 2011 to 5th February 2012. Sampling technique was convenience sampling. The caregivers were evaluated for the presence of depressive symptoms using the Centre for Epidemiological Studies Depression Scale (CES-D). The main outcome variable was the frequency of elevated depressive symptoms (score of 16) among primary caregivers which was described as frequency distribution tables.

**Results:** Out of 150 caregivers of schizophrenic patients, 45.6% were assessed to be depressed.

**Conclusion:** There are large numbers (45.6%) of caregivers who are depressed, and they need to be supported in their caregiving duties.

**Keywords:** *Schizophrenia. Depression. Primary caregiver.*

## INTRODUCTION

The schizophrenic disorders are characterised in general by fundamental and characteristic distortions of thinking and perception, and by inappropriate or blunted affect. Clear consciousness and intellectual capacity are usually maintained, although certain cognitive deficits may evolve in the course of time. The disturbance involves the most basic functions that give the normal person a feeling of individuality, uniqueness and self-direction. The most intimate thoughts, feelings and acts are often felt to be known to or shared by others and explanatory delusions may develop, which are often bizarre. The individual may see himself or herself as the pivot of all that happens. Hallucinations, especially auditory, are common and may comment on the individual's behaviour or thoughts. Perception is frequently disturbed in other ways: colours or sounds may seem unduly vivid or altered in quality. Perplexity is also common early on and frequently leads to a belief that everyday situations possess a special, usually sinister, meaning intended uniquely for the individual. Thinking may become vague, elliptical and obscur; and its expression in speech sometimes incomprehensible. Breaks and interpolations in the train of thought are frequent and thoughts may seem to be withdrawn by some outside agency. Mood is characteristically shallow, capricious or incongruous. Ambivalence and disturbance of volition may appear. Catatonia may be present. The onset may be acute, with seriously disturbed behaviour or insidious, with a gradual development of odd ideas and conduct. The course of the disorder shows equally great variation and is by no means inevitably chronic or deteriorating.[1] Schizophrenia appears in approximately 1% of the population in all the nations and races and affects males slightly more than females.[2]

Considering it's often chronic course and the fact that it has a relatively poor prognosis amongst psychiatric illnesses, it is not surprising that caregivers of patients suffering from schizophrenia have to deal with considerable burden and stigma; and that emotional distress results from this subjective burden and stigma.[3-6]

Emotional distress may often manifest as depressive symptoms and various studies have found increased levels of depression among caregivers of sufferers of schizophrenia.[6-8]

Depression is an emotional state characterised by sadness, apprehension, feelings of worthlessness and hopelessness. Loss of sleep and appetite may also occur. Depression can occur in many stressful situations, but it becomes a disorder when the symptoms interfere with normal functioning and last for weeks at times. According to world health organization (WHO), depression was the fourth leading cause of disease burden in 1990, while, in adults aged between 15 and 44 years, it was the leading cause of disease burden.[9]

In dealing with the schizophrenic patients, their caregivers experience variety of stress, both acute and

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*Received: September 15, 2015; Accepted: November 10, 2015.*

chronic, including social stigma.

Studies have shown that despite clinical improvement with pharmacological treatment, patients continue to have a poor quality of life and continue to depend, on caregivers.[10]

Caregivers in turn respond emotionally in a variety of ways to the challenges thrown at them by the situation. They may end up sacrificing their own physical and psychological needs for the patient. They may mourn the loss of the patient's previous personality, as well as the dreams and aspirations they may have had for him.[11]

Considering the above, it is hardly surprising that frequency of depressive symptoms is elevated in caregivers of patients of schizophrenia, and a significant proportion of them are at risk of developing depressive disorder.[6]

It is due to these significant psychological and physical morbidities associated with caring for patients of schizophrenia, that we intended to conduct this study. The objective of this study was to assess the frequency of depression amongst primary caregivers of schizophrenic patients, which would highlight the plight faced by them. A high frequency of depression, if demonstrated, would show that these people are under a significant degree of stress and that they also need support and management.

The objective of this study was to find the frequency of depression among primary caregivers of schizophrenic patients.

## METHODOLOGY

This was a cross-sectional survey conducted at Outpatient Department of Psychiatry Department, Jinnah Hospital Lahore. It lasted for six months i.e. from 3rd August 2011 to 3rd February 2012.

Sampling technique was convenience sampling.

One hundred and fifty primary caregivers of patients diagnosed with schizophrenia based on ICD-10 diagnostic criteria and presenting in Psychiatry outdoor department of Jinnah Hospital Lahore were selected for this study.

Sample size of 150 was calculated with 95% confidence level, 8% margin of error and taking expected percentage of depression among primary caregivers of schizophrenic patients to be 40% due to a similar percentage obtained in Magana et al. which also studied depression among primary caregivers of schizophrenic patients.[6]

### Inclusion criteria

Primary family caregivers (defined in Magana et al. as that family member who gives most care to the patient)of patients of schizophrenia diagnosed using ICD-10 diagnostic criteria.[6,11]

- Age ranging 21-65 years
- Both male and female caregivers

### Exclusion criteria

- Caregivers having the previous history of depressive illness prior to the onset of patient's illness.
- Caregivers having any medical (meaning physical) illness e.g. diabetes, hypertension, hypothyroidism, hepatitis etc, diagnosed by a physician.

(Both these were determined by taking detailed history & examination from the caregiver, and whenever in doubt, lab investigations. No screening lab investigations were done). The rationale for ruling out co-morbid physical illness was that physical illness is itself a risk factor for depression and can precipitate depressive symptoms; thus inflating the frequency of clinically significant depression.

One hundred and fifty primary caregivers of patients diagnosed with schizophrenia based on ICD-10 diagnostic criteria and presenting in Psychiatry outdoor department of Jinnah Hospital Lahore were selected according to the above-mentioned criteria. The nature of the study was explained to each subject and written informed consent was obtained after ensuring them of total confidentiality. As some details of the schizophrenic patients were also to be included in the proforma (as mentioned below) they were also informed of the nature of the study, and their consent was also taken while reassuring them about confidentiality. All subjects were assessed according to the following pattern: Socio-demographic details were obtained from each subject and were recorded on a self-devised proforma. Age of patient, duration of schizophrenia ($\leqslant$24 months or >24 months), relationship with caregiver were taken as effect modifiers and also recorded in the proforma.

Depression was evaluated by administering Center for Epidemiologic Studies Depression Scale (CES-D).[12] It is a standardized and validated instrument to measure depressive symptoms. The original 20 item version published by Radloff in 1977 was used. As there was no Urdu version of the scale, we translated it and administered it via interview. The scale consists of 20 scored items, each with 4 response levels. Patients rated each item based on its duration throughout the past week. (0: Rarely or none of the time to 3: All of the time). Summing all the responses scored the test. The cutoff value for being depressed was 16. This cutoff value was adopted from Radloff's original validation study, which found a score of 16 or above to suggest depression. This data was also recorded on the proforma. All the patients were interviewed by the researcher himself.

All the data collected during the study were analyzed

using statistical package for social studies (SPSS version 10.0). The quantitative data such as age were presented as a mean and standard deviation. The qualitative data like gender and presence of depression were presented as frequency and percentages.

## RESULTS

A total of 150 caregivers of patients of schizophrenia who reported in the outdoor clinic were included in this study. No patient included in this study was dropped.

**Distribution of caregivers by age:**

The mean age of the caregivers was 45.3 years with a standard deviation of 12.7 (age range 41-50 years). There were 18 caregivers (12%) of age range 20-30 years, 30 caregivers (20%) of age range 31-40 years, 51 caregivers (34%) were in the age range 41-50 years, 30 caregivers (20%) were of age range 51-60 years and 21 caregivers (14%) were in 61-70 years age range.

**Distribution of caregivers by sex:**

There were 39 (26%) male caregivers and 111 (74%) female caregivers in this study.

**Distribution of schizophrenia patients by age:**

The mean age of patients of schizophrenia in this study was 27.06 years with a standard deviation of 10.07. Forty two patients (28%) were under 20 years of age, 66 (44%) were between 20 and 30 years of age, 30 (20%) were between 31 and 40 years of age, 3 patients (2%) were between 41 and 50 years and 9 (6%) were between 51 and 60 years of age.

**Distribution of schizophrenia patients by illness duration:**

Ninety (60%) patients had been ill for more than 24 months while 60 patients (40%) had been ill for less than 24 months in this study.

**Distribution of schizophrenia patients by relation to caregiver:**

One Hundred and five (70%) patients were the offspring of their caregivers, 12 (8%) were siblings, 6 patients (4%) were parents of their caregivers, 6 (4%) more were spouses of their caregivers and 21 (14%) were related to the caregivers in some other way.

**Frequency of depression (according to CES-D scale) among caregivers:**

Seventy four (49.3%) caregivers had elevated symptoms of depression according to CES-D scale while 76 (50.7%) did not meet the cut off score for depression on CES-D scale.

**Distribution of depression by sex:**

Amongst the male caregivers, 20 (51.3%) were depressed while 19 (48.7%) were not. Among the females, 54 (48.6%) were depressed, while 57 (51.4%) were not.

Further characteristics of the distribution of depression among caregivers in relation to variables in the caregivers' and patients' bio-data are given below in the form of bar charts from Figure 1 to 5.

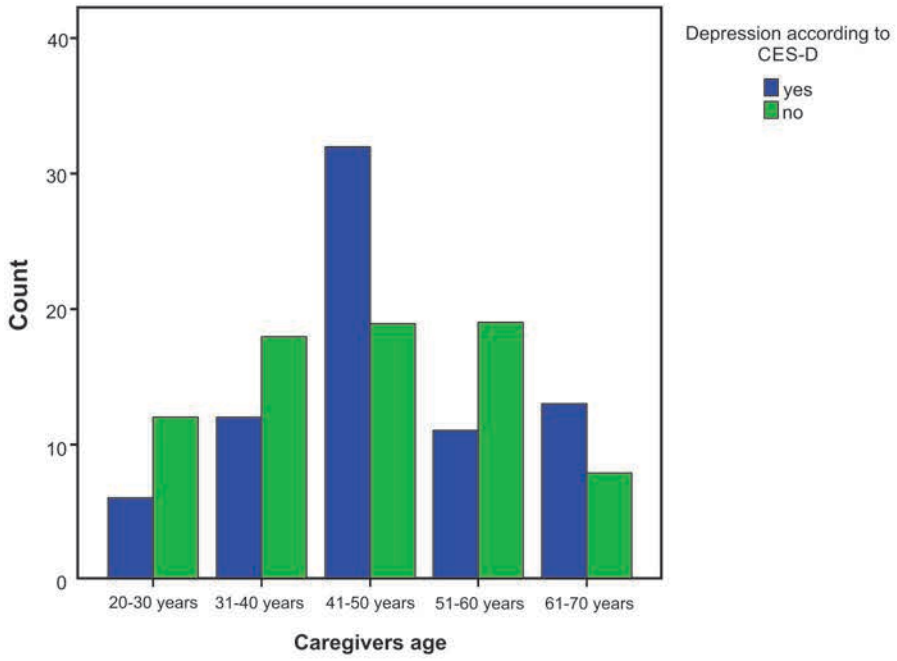


**Figure 1: Distribution of depression among the caregivers' age ranges.**

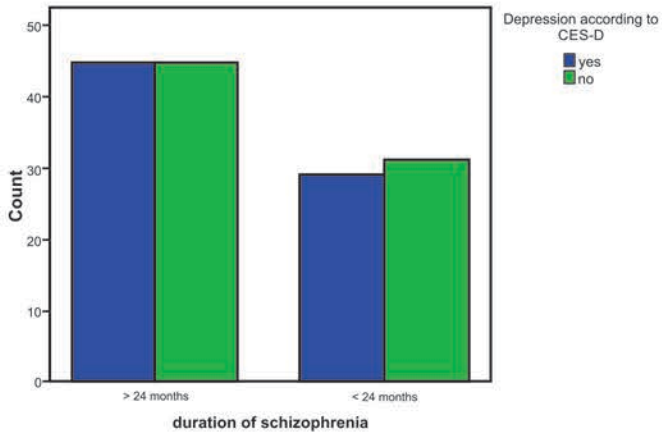


**Figure 2: Patient age and depression among caregivers**

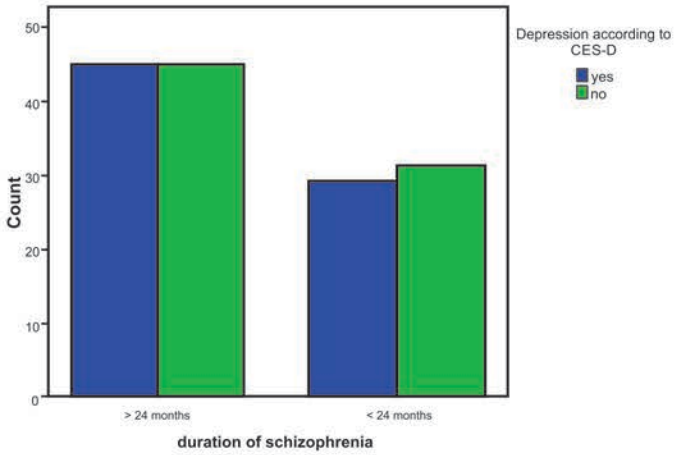


**Figure 3: Illness duration and depression among caregivers**

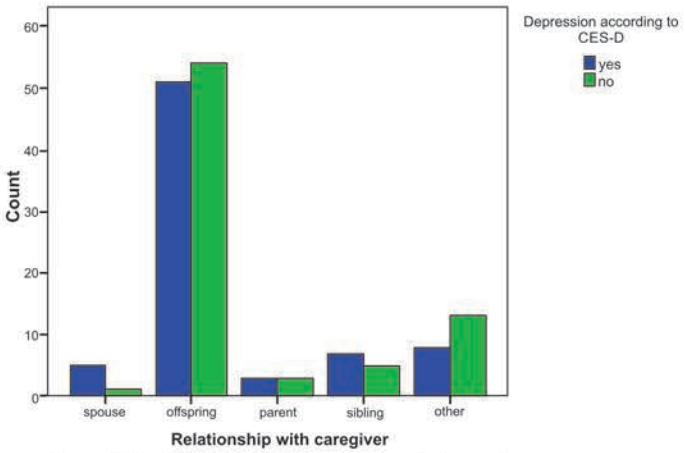


**Figure 4: Relationship with caregiver and depression**

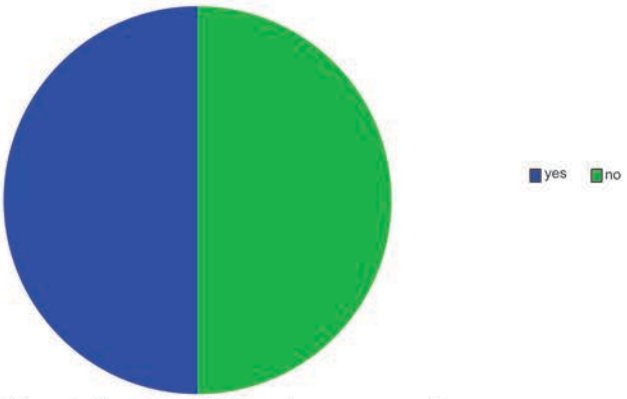


**Figure 5: Frequency of depression among caregivers**

## DISCUSSION

In this study, we studied a total of 150 caregivers of patients of schizophrenia. It was designed to describe depression among primary caregivers of schizophrenic patients who presented in psychiatry outdoor. Among these subjects of our study, the frequency of elevated symptoms of depression, as recognized by the cutoff score of 16 on CES-D scale, was 74 (49.3%). Among these 74 caregivers, 20 (27%) were males while 54 (73%) were females. The ages of the caregivers ranged between 20 years and 70 years, with the greatest percentage of depression (62.7%) being found in the 41-50 years age range.

Among the earlier studies that assessed emotional distress among caregivers, was Gibbons et al. in 1984 which found that 72% of carers suffered from psychological ill health, when assessed by the Social Behaviour Assessment Schedule (SBAS) scale, while 32% had emotional distress according to the General Health Questionnaire (GHQ) scale.[14] The study also found that more caregivers had symptoms of anxiety and insomnia, then somatic complaints and then least had depressive symptoms. Also, the study found new caregivers to be having the most emotional distress. The finding of relatively less depressive symptoms was different from a number of later studies such as Magana et al. who found increased depressive symptoms in 40% of caregivers.[6] Our current study found an even higher frequency of depression of 49.3% (74 caregivers). Our study also disagreed with the finding in Gibbons et al. in that new caregivers were more likely to be emotionally disturbed than old caregivers.[14] The current study found that depressive symptoms were higher in those caregivers whose patient had been ill for more than 24 months. There may be several reasons for the differences between this early study and later work, particularly the current study, most importantly that the scales that were used were different, and measured emotional distress, in general, with depressive symptoms only being measured as a subset of the overall questionnaire. Another important early study concerned with the psychological well-being of caregivers of patients of schizophrenia was of Oldridge and Hughes in 1992.[15] They found that 9 out of 25 caregivers (36%) were emotionally distressed according to either the GHQ or hospital anxiety and depression scale (HADS) scales. Comparing with our current study, the difference may first be explained by the fact that scale used was different and the sample size was very small (25 caregivers). Also, all the patients were receiving intramascular depot injections, which may have significantly reduced the aggravation and distress associated with giving a psychotic patient oral medicines daily. Besides this, a number of factors which differentiate between giving care to a psychotic patient in a first world environment and third world environment, such as quality, affordability and availability of psychiatric care may have had a role in the above two studies' differences with our's and other later work. Interestingly, as above mentioned, Oldridge and Hughes found greater distress among caregivers of patients with negative symptoms, while Gibbons et al. found greater distress among those caring for patients with active psychotic symptoms. Various later studies have also supported this such as Magana et al. and Gulseren et al.[6,16]

More recent studies upon the subject of emotional distress and especially depression among caregivers have also been done, many of them in a third world setting. Notable among these is a study conducted in the USA on the Latino community and published in 2007.[6] Magana et al. found that 40% of caregivers met the cutoff score for being depressed on the CES-D scale. Our current study, in comparison, found a somewhat higher frequency of elevated depressive symptoms. Another important difference was that in the current study, depression was most frequent in the 41-50 age range (62.7%), while in caregivers between 20 and 30 years age it was 33.3%. This is in contrast to the conclusions of Magana et al. that younger age is correlated with depression.[6] The reasons for this difference could be varied including the fact that there were only 18 caregivers in the 20-30 age bracket, which is a very small sample size.

Besides this differences between social support and assistance available to caregivers in the USA and Pakistan, where the extended family system is strong may have been important.

Another study, which was conducted in Nigeria, and published in 2011, found that, (similarly to our study) a majority of caregivers was female, (but differing from our research) and found majority of them were siblings of the patient.[17] Our data, on the other hand, showed that a majority were parents of the patients. Furthermore, using HADS, they found that 79.84% of caregivers suffered from emotional distress. Of these, 8.5% had significantly elevated depressive symptoms (as measured by depression subscale of HADS), 19.4% had significantly elevated anxiety symptoms and 51.94% had both elevated anxiety and depressive symptoms. There are a number of interesting comparisons with our study in this paper. In the current study, 51.3% of male caregivers were depressed and 48.6% of female caregivers were depressed. There is also a slight preponderance of elevated depressive symptoms of depression in male caregivers in our data, even though this tendency is greater in the Nigerian study. Besides this, the Nigerian study found that if the caregiver was a parent of the patient, he/she was more likely to be depressed, while in the current study, the

offspring of the patient, their spouses or siblings were found to have a greater chance of elevated depressive symptoms. The overall estimation of depression frequency, as above mentioned, was also higher than in our study. This may have been due to different scale, different sample size (129 caregivers) and due to demographic differences.

A recent study by Rizwan Taj et al. published in Pakistan that dealt specifically with depression among primary caregivers of patients of schizophrenia. As expected it found , generally high scores of depression according to the BDI scale. The mean score for the whole sample was found to be 22.5. Besides this, the study found that mean score on Beck's depression inventory (BDI) was increased in those caregivers whose patients had been ill for more than 24 months. It found BDI scores to be greater among female caregivers, greater among spouses as compared to non-spouse caregivers, slightly greater in those with more education and increased in those with family size greater than 6, although not significantly.[11] In comparison to the current study, there were some similarities and some differences. The finding of greater depression among those with more chronic illness was in agreement with our study, but the greater frequency of depression among females, although similar to the general population trend, was at variance with the current study as well as the study from Nigeria. The finding that spouses had more depression than other relationships was in agreement with our findings too.

Studies which have been conducted in the Middle East have shown varying pictures of the correlates of distress and depression among caregivers, making for interesting comparisons with the current study. In Turkey, Gulseren et al. conducted a study upon the perceived burden of care and its correlates. [16] Their finding of increased depression among the caregivers, in general, is in agreement with our study, but the finding that female caregivers experienced more burden seemed to be at odds with the implications of our study.

In Israel, a study was conducted which took a novel approach to the problem of psychological wellbeing of caregivers of schizophrenic patients.[18] It was unique in that it was measuring positive emotions like hope in the context of schizophrenia. Distress, in general, was found to have a strong inverse relationship with hope as well as a strong positive correlation with maladaptive coping mechanisms, but no significant relationship with adaptive coping was seen.

One important disadvantage of this current study and other like it was that participants belonging to certain socio-demographic brackets were not represented in large numbers, therefore it was not possible to give much credence to findings of depression frequency among them. For example, only 18 caregivers in this study were in the 20-30 years age group. Additionally, only 12 caregivers were siblings of the patients by relation, only 6 were children of their patients and 6 more were spouses. Thus such papers which specifically deal with the psychological health of subgroups are needed. In this regard, a paper by Subhrati Ghosh and Jan Greenberg was published in 2009, which studied the psychological wellbeing of fathers of adults schizophrenic patients.[19] Using CES-D scale, it found 34% of fathers had clinically significant symptoms of depression.

Another study which qualitatively studied burden and psychological wellbeing among spouses of patients found there to be unique stressors and considerations when the caregiver is a spouse.[20] Burdens, besides the usual illness related ones, also pertain to their partnership and family roles.

Overall, all the above studies show a significant variation in frequency of depressive symptoms, largely due to different scales being used, different sample sizes and different regional settings.

In summary, our study also shows a large number of caregivers with elevated symptoms of depression, who need support and in some cases, psychiatric treatment.

Our study also had some salient limitations which deserve to be mentioned:

- There was no control group, so one cannot attribute the burden of depressive symptoms to the caregiver role.
- The severity of the schizophrenia among patients was not assessed.
- No tests of significance (calculating p-value) were conducted to determine if the difference in distribution based on age, sex, duration of illness were statistically significant or not.

## CONCLUSION

The following recommendations can be made based upon the above discussion:

- Assessment of caregiver depression appears to be a worthwhile strategy to identify those that may need more support from the mental health team in the coming days.
- Clinicians should, as a matter of habit, pay due attention to the emotional needs of caregivers of patients with the chronic mental illness.

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Original Article

# Submuscular Placement of Silicone Gel Implant for Breast Augmentation: A Short Term Experience

Naveed A. Khan, Ijaz Shah, Abrar ul Hassan Pirzada

**ABSTRACT**

**Objective:** This study was done to assess the efficacy of the implants in 30 consecutive patients who presented for breast augmentation.

**Methodology:** Data was prospectively collected for all patients who underwent bilateral breast augmentation between July 2014 to July 2015. Breast augmentation was performed by placing textured, round, silicone gel intraglandular position implants via inframammary approach. The 30 patients included in this series were analyzed according to demographic details, preoperative & postoperative findings and observer satisfaction scores, and complications. Standard pictures were taken before surgery and during follow-up visits over 6 months; standardized objective measurements of breast and chest were also taken. The test statistics used to analyze the data were descriptive statistics and repeated measure ANOVA. A Visual Analogue Scale (VAS) was used to evaluate the subjects' global impression of clinical improvement and one independent observer visually reviewed pre and postoperative result to grade aesthetic results.

**Results:** Observers evaluation by predefined criteria (volume, shape, consistency, inframammary fold and scar) rated 60 % of patients with excellent outcome, 30% good, 10% fair and none had a poor score. A significant percentage (63.3%) of the 30 patients rated their satisfaction as very good and nine (30%) patient rated as good. None of the patients responded the result as poor or as very poor. No serious complications such as implant malposition or significant capsular contracture were observed.

**Conclusion:** We conclude that round textured cohesive gel implants provide excellent results, are well accepted by patients; and most short-term postoperative adverse effects following cosmetic implantation are clinically insignificant and do not require treatment.

**Keywords:** *Augmentation mammoplasty. Silicone gel implants.*

## INTRODUCTION

The role of augmentation mammoplasty is obviously to increase the volume, size, profile and projection of breast along with improvement in breast symmetry, shape and nipple position.[1,2] Woman choose to undergo breast augmentation because they are naturally small busted, have developed excessive volume loss with pregnancy, lactation or weight loss, have developed breast sagging, have an asymmetry in breast size or shape or simply want to enhance their existing breast contour (Table 1).[1] Woman with smaller than normal breast usually have negative body image and seeks correction through augmentation mammoplasty. A beautiful breast must look natural and in proportion with rest of the body. Therefore the conceptual goal of breast augmentation is to have a soft, full, natural looking, non-ptotic, well positioned mobile breast that respond to gravity and postural changes along with fewest possible complications and also to fulfil patients desire. Woman who is concerned about the size of their breast, seek an improved appearance with breast augmentation to conform to their own body image. This, in general, enhances their self-image, increase self-assurance and establish a better interpersonal relationship. Silicone gel breast implants were first introduced for the use of breast augmentation by Dow Corning in 1962 following the original designs of Dr. Cronin and Gerow.[3] These implants have gone from a 1992 moratorium on approval in 2006, with many developments in manufacturing and usage in between and currently dominate the worldwide breast implant market. Silicone gel implant commercially available today is refined and safer device than their predecessors. Meta-analysis of data now support the safety of breast implants in general, with the main safety concerns being the potential for local complications and the need for secondary surgeries. With the advances in implant technology involving both enhanced texturing and cohesiveness; a more consistent aesthetic breast form can be achieved. In general silicone gel filled implants tends to feel more natural, look better subglandularly compare with saline implant show less rippling and better suited for the patient with minor ptosis. The consistency of the gel creates softer, more natural peripheral breast contour and overall softer feel to the breast. The surgeon can use specific measurements of breast width and projection to custom select an implant specific to each breast. Patients need to be carefully selected and oriented and at the same time, proper evaluation of the case and

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*Received: August 20, 2015; Accepted: November 22, 2015.*

choice of an adequate implant and plane of location are essential to obtain consistently excellent result.[3]

Augmentation mammoplasty has become one of the most popular aesthetic procedures in the world. It is estimated that more than 1 % of the adult female population in the United States (between1and 2 million) has undergone breast augmentation using the implant. About 80% of implants replaced for cosmetic purposes and 20% for reconstructive reasons.[4] With rapid economic development in Southeast Asia, breast augmentation and other cosmetic surgeries are increasingly performed. Due to skepticism and ignorance, this cosmetic surgery was not popular for a long time in Pakistan but with economic growth and educational development, as well as the availability of silicone gel implant and skilled surgeons, the demand, popularity and acceptance of this surgery is gradually increasing. In spite of our conservative culture and religious taboos woman in Pakistan are becoming interested in this procedure.

## METHODOLOGY

### Sample Population

This prospective interventional study analyzed 30 patients undergoing primary augmentation mammoplasty between July 2014 to July 2015 in different private hospitals as well as in Plastic Surgery Department, Sharif Medical City Lahore. All female patients aged 18 years or above with hypomastia and desiring for cosmetic breast augmentation were considered as the study population. The exclusion criteria were previously performed breast surgery and simultaneously conducted mastopexy, medical history precluding suitability for surgery (eg, advanced fibrocystic disease or inadequate breast tissue), pregnancy or breastfeeding, any condition that might constitute an unduly high surgical risk and psychological characteristics that might be incompatible with the surgical procedure or the implant. This study was approved by Hospital Ethics committee. Informed consent was taken from all patients.

### Data Recording

**Preoperative data:** The traditional system of cup size measurement was utilized in the present study and later view were recorded as shown in Figure 1 (a, b). In all cases, the following were recorded: patient demographic information, breast cup size, breast width, the presence of ptosis, midline-to-nipple distance, areola-to-inframammary fold (IMF) distance (Figure 2), suprasternal notch-to-nipple distance.

**Operative data:** The volume of implants placed was recorded in each case. Implant selections were made based on data from measurements, including reasonable patient wishes for size outcome (Figure 3). Large-volume augmentation with devices that exceeded the breast base diameter was avoided.

**Postoperative data:** Data regarding the aesthetic effect of implantation on the breast included correction of ptosis and postoperative cup size increase. Early complications were recorded, including hematoma, wound infection and seroma formation. Longer-term outcomes such as scar quality, capsular contracture (CC) and nipple sensation were recorded at least six months postoperatively. The results were evaluated and compared 1, 3 and 6 months after augmentation using the patients' own assessments (a rating of 0–10 points) and scoring by an observer (using five subscales of the modified Garbay system). Each patient received an assessment sheet to record her postoperative satisfaction with clinical improvement using a visual analogue scale (VAS), indicating satisfaction with volume, symmetry, shape, scar & consistency. Breast symmetry, shape, inframammary fold, consistency and scar quality were subjectively evaluated during follow-up visits following surgery by an observer. The effective evaluation included changes in bra cup size from pre to post-surgery, subject and observer satisfaction with the implants.

### Surgical Method

**Preoperative planning:** Implant base diameter selected was 0.5 cm less wide than the existing breast width.

Implant projection was selected by subtracting the preoperative mammary projection from the projection desired by the patient. After considering these two implant variables, implant volume was determined from the manufacturer's published data charts. By this means, an approximate volume and projection of the implant were determined preoperatively. In this patient series, only round, textured, cohesive silicone gel implants were placed in the sub glandular pocket by giving inframammary incision.

**Operative technique:** All patients were counselled and informed about the risk and benefits of the procedure.

Preoperative markings were done with patients standing in normal anatomical position. The boundaries of implant pockets were delineated. With the patient under general anesthesia: access in all cases was via an inframammary incision no more than 5cm in length, skin and subcutaneous tissue were incised. After sharp dissection on top of pectoralis major fascia, sub glandular pocket preparation was completed bluntly using finger dissection according to preoperative marking (Figure 4 and 5). Preoperatively selected silicone gel, textured, round implant with definite volume was inserted into the pocket followed meticulous hemostasis. The closure was achieved in 3 layers- fascia and dermal layer with 4-0 monocryl

sutures (Figure 6). Surgical dressings were applied to the wounds (Figure 7). Oral antibiotics were continued for one week postoperatively. Patients were advised to avoid physical exercise for 3 weeks. Follow-up care consisted of an outpatient visit on 1st, 4th, 12th and 24th week.

## RESULTS

### Preoperative Data

Demographic data revealed that the mean age of patients was 31.8 years (range, 20-40 years). The majority of women were married (76.6%), housewife (43.2%), and were graduate (73.2%). A maximum number of subjects was candidate for cosmetic breast augmentation (46.6%). Grade -1 Ptosis was present in 8(53%) cases. The most common pre-augmentation cup size was A, with a range from AA to C.(Table 2)

### Operative Data and post perative Data

The size of implant placed in primary augmentation ranged from 180 - 380 cc and in 43.3% cases implant volume used were between 280-300cc Postoperative data follow-up ranged from 1 week to 6 months. The postoperative assessment showed an overall increase in breast volume by an average of 2.96 cup sizes. The postoperative majority of augmented subjects had an increase in 3 cup size (76.7%) followed by 2 cup size increase (13.3%) and 4 cup size increase (10%). None of the patients had single cup size increase. The post-implantation increase in cup size was significant and met the patients' desire. Breast ptosis was corrected in 7 patients (96.7%) out of 8 by placing implant but only one (3.3%) patient still had ptosis after augmentation. The data collected during visits showed that at 1st week postoperatively the most common complications for augmentation subjects were breast pain (26.7%)and altered nipple sensory change noted in 11(16.7%) of the 30 primary augmentation cases. In 3 cases, this change was unilateral, and in 8 cases, it was bilateral. Early complications included 3 cases (10%) of hematoma requiring drainage, 5 cases (16.7%) of small seroma not requiring surgery and 1 (3.33%) minor postoperative wound infections requiring antibiotic treatment. Over one-third (36.7%) of surgery-related minor complications (like a hematoma, seroma, infection, breast pain and altered nipple aerolar complex (NAC) sensation developed in the 1st week which then gradually decreased and only 2 cases (6.7%) of altered NAC sensation and 2 cases (6.7%) of breast pain at 6 month. Implant palpability/visibility was experienced by 2 patients (6.7%) and 2 patients (6.7%) had hypertrophic scarring at 6 months. Subjective patient assessment, at least, six months postoperatively revealed a high level of patient satisfaction. Patients own appraisal of satisfaction with overall outcome was judged on a scale of 1 to 10, where the patients were asked to score by their own satisfaction regarding volume, symmetry, shape, scar & consistency. The data was recorded by a non-biased third person not related to this study. A large number of patients marked their satisfaction as very good (19, 63.3%), good (9, 30%) & satisfactory (2, 6.7%).Whereas, none of the patients responded the result as poor or as very poor (Table 4). Observers evaluation (subjective) by predefined criteria (volume, shape, consistency, inframammary fold and scar) rated 60 % of patients with excellent outcome, 30% good, 10% fair and none had a poor score (Table 5).The current study was a short-term study with small population size. Preliminary safety and effectiveness data from this study indicated that the use of the silicone gel implants yields no capsular contracture, no rupture, no displacement, no revision rates, as well as decreased complication rates and high satisfaction rates. Subject satisfaction with implants was from very good to good in 93.3% cases. Observer evaluation was excellent to good in 90% cases. The overall consensus was that there was a visual improvement of the breast when compared with the preoperative status. Majority of breast ptosis were corrected (96.7%) and 76.7% the patient had 3 cup size increase after augmentation (Figure 8).

**Table 1: Indications for breast augmentation**

| Indication | Frequency | Percent |
|---|---|---|
| Cosmetic augmentation only | 14 | 46.6 |
| Augmentation with breast ptosis | 8 | 26.6 |
| Augmentation with post lactation involution | 6 | 20.0 |
| Augmentation with congenital hypomastia | 2 | 6.8 |
| **TOTAL** | **30** | **100** |

**Table 2: Preoperative cup size.**

| Cup size | Frequency | Percent |
|---|---|---|
| **AA** | 6 | 20.0 |
| **A** | 20 | 66.7 |
| **B** | 3 | 10.0 |
| **C** | 1 | 3.3 |
| **Total** | **30** | **100.0** |

**Table 3: Postoperative Increase in Cup size**

| Increase in Cup size | Frequency | Percent |
|---|---|---|
| One Cup size increase | **0** | 0.0 |
| Two Cup size increase | **4** | 13.3 |
| Three Cup size increase | **23** | 76.7 |
| Four Cup size increase | **3** | 10.0 |
| **Total** | **30** | **100.0** |

**Table 4: Patients own appraisal of satisfaction**

| Satisfaction Score | Frequency | Percent |
|---|---|---|
| **Very Good (9-10)** | 19 | 63.3 |
| **Good (7-8)** | 9 | 30.0 |
| **Satisfactory (5-6)** | 2 | 6.7 |
| **Poor (3-4)** | 0 | 0.0 |
| **Very Poor (0-2)** | 0 | 0.0 |
| **Total** | **30** | **100.0** |

**Table 5: Evaluation of outcome by observer (n= 30)**

| Evaluation (score) | Frequency | Percent |
|---|---|---|
| **Excellent (10 – 9)** | 18 | 60 |
| **Good (8 – 7)** | 9 | 30 |
| **Fair (6 – 5)** | 3 | 10 |
| **Poor (4 – 1)** | 0 | 0 |
| **Total** | **30** | **100** |

**Table 6: Distribution of patients by complications encountered (n= 30)**

| Complications | Follow up period | | | |
|---|---|---|---|---|
| | 1 Week n (%) | 1Month n (%) | 3 Month n (%) | 6 Month n (%) |
| **Surgery related** | **11(36.7)** | **8(26.7)** | **7(23.3)** | **4(13.3)** |
| **Hematoma** | **3(10.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| **Seroma** | **5(16.7)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| **Infection** | **1(3.3)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| **Breast pain** | **8(26.7)** | **8(26.7)** | **5(16.7)** | **2(6.7)** |
| **Altered NAC** | **11(36.7)** | **7(23.3)** | **3(10.0)** | **2(6.7)** |
| **Implant related** | **0(0.0)** | **4(13.3)** | **6(20.0)** | **4(13.3)** |
| **Implant visibility** | **0(0.0)** | **4(13.3)** | **4(13.3)** | **2(6.7)** |

| | | | | |
|---|---|---|---|---|
| **Implant palpability** | **0(0.0)** | **4(13.3)** | **4(13.3)** | **2(6.7)** |
| **Hypertrophic scar** | **0(0.0)** | **0(0.0)** | **2(6.7)** | **2(6.7)** |

**Figure 1: (a) Pre-operative right lateral view**

**Figure 1: (b) Pre-operative left lateral view**


**Figure 2: Inframammary Incision Marking**

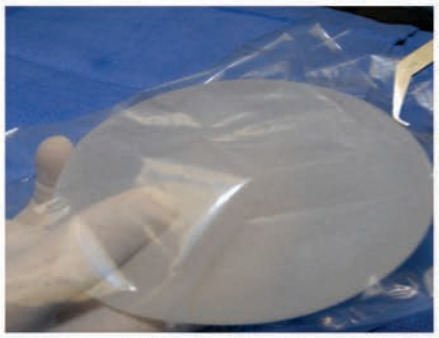

**Figure 3: Implant taken out of sealed container.**

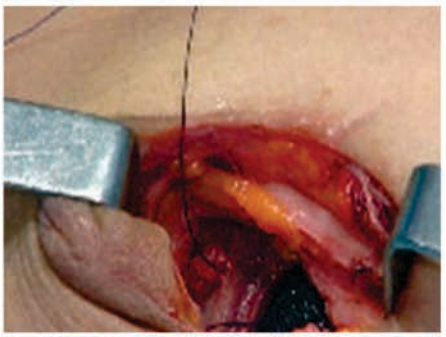

**Figure 4: Once the implant is placed, the muscle is sutured.**

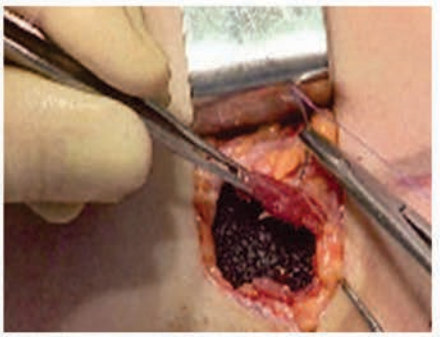

**Figure 5: The divided pectoralis major muscle is sutured.**

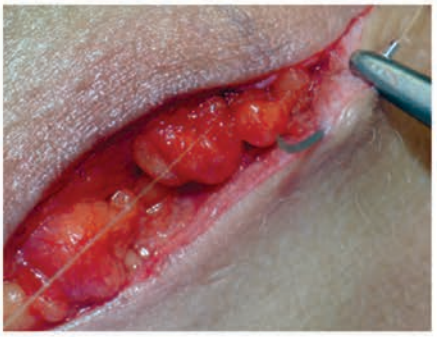

**Figure 6: Skin closure with 4-0 monocryl**

**Figure 7 :Incision closed**

**Figure 8: Subglandular breast augmentation 6 weeks postoperatively implants were placed bilaterally in subglandular pockets**

## DISCUSSION

Analysis of demographic data in our study revealed that the patient's age varied from 20 years to 40 years, with mean age 31.8 ± 5.1 years. The majority of women were married (76.6%). Occupational distribution showed most of the women to the housewives (43.2%), followed by professionals (33.3%). Most of the subjects were graduates (73.2%) and attended college (16.7%). These demographic profiles reflect that women in our study group were educated, financially solvent and married. Subject compliance with the follow-up schedule was 100%. A prospective, nonrandomized study revealed that median age was 36 years for augmentation subjects, most subjects were caucasian, married and attended college.[5] Subject compliance with the follow-up schedule was excellent through the first 3 years of the study. Another multicenter clinical study in patients undergoing augmentation reported mean subject age at the time of surgery was 38 years, the majority of subjects were married, and the most commonly reported household income exceeded $80,000.[6] The majority of study subjects had completed some college education, with 43% holding at least, a bachelor degree and more than 8% having completed postgraduate level education. The above result was somewhat similar to the demographic profile of the current study with higher median age. Due to a social, cultural, financial and religious difference, the women of our society usually do not come for augmentation after the age of 40 years, whereas in the western world older age group are equally concerned about their body image and are interested for the procedure. Regarding the financial status, our women can usually afford low-cost implant unlike the western women who are more financially independent can avail more expensive and modern implants. In this study the most frequently used size of the textured round implants positioned in the breast was 280 -300 cc. (mean 284.6 ± 4 7.1 cc) A study with Contour Profile Gel implant the volume of the "cosmetic" implants ranged from 215 ml to 355 ml, with 280 ml being the most frequently used size. Other studies also used similar range of implants between 280 cc to 320 cc & 190 to 475 cc, with a median of 280 cc.[7] In our study only 8 patients (26.7%) had grade-1 ptosis preoperatively which was corrected in 7 patients (96.7%) after augmentation. A study was done in Brazil also showed a reduction of breast ptosis present in 53% of cases (Grade 1,40.5%; Grade 2, 12.5%).[8] Thus in the current study, it is evident that breast ptosis was significantly corrected using silicone gel implant in comparison to the study done in Brazil. If we consider the preoperative cup size of the subjects in this study, the majority 20(66.7%) had a cup size A.

Postoperatively, majority of augmented subjects had increased 3 cup size (76.7%) followed by 2 cup size increase in (13.3%) and 4 cup size increase in (10%) cases. A study on 200 patients reported the most common pre-augmentation cup size was A.[8] The postoperative assessment showed an overall increase in breast volume by an average of 2.6 cup sizes. A nonrandomized study provided 3-year follow-up found that a majority of subjects (53 %) had an increase of two cup sizes, and the second most common outcome was an increase in one cup size (38 %). [5] Scott et al. in a study showed an increase in the size were either one cup size (41%) or two cup sizes (45 %).[9]

Most of the studies including our study reported a significant increase in cup size after implantation but our study gained more increase in cup size. The reason may be due to insertion of a larger volume of implant sub glandularly. Furthermore Asian patients have special characteristics that need to be taken into consideration when performing breast augmentation. Asian women are usually short and slim with low body mass index and small breasts compared with Westerners and African Americans. Most women consider C-cup breasts as the ideal size when they are contemplating undergoing augmentation mammaplasty.[10] In this study the observer graded the aesthetic outcome as excellent in 60% cases, good in 30% and fair in 10% subjects at 6 months. No patient scored poor result. Aesthetic judgement revealed observer's satisfaction with the breast appearance by giving excellent to fair score at the end point of the study. A study with contour profile gel implant showed 85% of the breasts were rated as soft.[11] Current study reported soft consistency in 76.7% at the 6-month follow-up. Results were nearly similar between both the studies. Currently, in the more competitive health care area, patient satisfaction has become an issue of considerable interest.

Breast appearance was subjectively evaluated by the patients during follow-up after surgery. During the first review, all patients were satisfied with the shape but 80 percent thought the implants were too big. In the one-month review, 40 percent of patients still thought the implants were big although they liked the shape. At 6 month review, they reported satisfaction with size, shape and consistency. The women who had experienced detectable complications, i.e., visible or palpable implant conditions and hypertrophic scar were less satisfied than the women who had undergone complications leaving no visible or palpable sequelae. The most compelling finding was that 97 percent patient stated overall feeling that their breast implantation had been advantageous and subject satisfaction remained high during 6 months after implantation. According to the visual analog scale (VAS), good-to-very good patient satisfaction was

observed in 93.3% cases. In our series, none of these patients requested revision surgery. A similar result was seen in a survey done in Brazil. Their experience with PERTHES silicone breast implants showed over 97% of patients were satisfied with the surgery results, with 79.6% of patients rating the surgery results as excellent. Less than 1% patients were not satisfied with the surgery results.[12]

The overall assessment of breast aesthetics by the observer and patient yielded comparable results with high degree of satisfaction. Other different studies showed patients and observe satisfaction with breast augmentation was over 90%.[8,13] Results were similar with our study. In the current study early experience showed that silicone gel implants are well accepted by the patients without any serious aesthetic complications as malposition or capsular contracture. None of our patients experienced any capsular contracture during the short study period. This is in accordance with the findings in a small study of sub glandular breast augmentation with soft cohesive silicone gel implants.[11] It has been hypothesized that this may be attributable to the insignificant silicone gel bleed of cohesive gel implants. For instance Heden et al. implanted 1676 anatomic cohesive gel implants, and postoperative malposition occurred in only 1.1% of cases. Malposition may be more related to errors in implant selection or suboptimal techniques of pocket dissection and pocket dimensions.[11] Accurate pocket dissection and avoidance of over dissection, along with the use of closed suction drains, are also important factors that will promote device-tissue contact.

Postoperative problems included a change of tactile sense of NAC region which was the most frequent and early adverse effect in 11 cases (36.7% of women), but was temporary in most cases and recovered fully in 9 patient at 6 month follow-up. The eight cosmetic augmentation patients complained about postoperative dull pain in their augmented breasts, which gradually subsided in 6 patients within 6 months after they were reassured by counselling. Several patients also experienced small seromas (5 patients, 16.7%), hematoma (3 patients, 10%) and infection in 1 patient at the first week of follow-up. All resolved with conservative drainage measures and with antibiotics. Two patients had hypertrophic scarring; incidence of visible and/or palpable implant edges at the medial or lateral breast regions occurred in only 2 cases at 6 months. The firmness of the implant can sometimes result in a palpable edge. Therefore, at the end point of the study only 13.3% patient had altered nipple sensation and dull aching breast pain; also, 13.3% patient had implant visibility/palpability and hypertrophic scar. The overall implant-related cosmetic complication rate was 13.3%. Sensory changes in the nipple-areola complex and periodical pain in the breasts seem to be common after such surgery.

A short-term study by Seify et al. showed immediate complications comprised of delayed wound healing in one case (2.63%), one case of haematoma (2.63%) and one case seroma (2.63%); no major late complications occurred during the 1-year follow-up period.[14] The study concluded that most short-term postoperative adverse effects following cosmetic implantation are clinically insignificant and do not require treatment. The inference was similar to our study.

According to Fruhstorfer, no serious anesthetic complications such as implant malposition or significant capsular contracture were observed.[11] A long-term study done in Copenhagen reported serious capsular contracture (Baker III and IV) was found in 62% of patients. Twenty implants (6%) in 13 women were recorded as ruptured. Visible implant folds were seen in 19 breasts (6%) and breast augmentation had prolonged breast pain, 8.3% had changes in sensibility, 0.8% had visible skin wrinkles and folds were palpated in 1.2% of women. The majority of the women were troubled by either some (31%) or serious (36%) breast hardness (capsular contracture). Eighteen percent patients reported breast pain, in most cases graded as moderate.[15] None of the patients in our study experienced any vital complications and the pattern of complication occurred was more or less consistent with the short-term studies by Seify et al. and Fruhstorfer BH.[11, 14] But long-term studies like the done in Copenhagen presented serious complications as capsular contracture, implant malposition rupture. This was probably due to longer follow-up period, large population size and use of long-term cosmetic breast implants dating back to the beginning of the implantation era, These serious conditions were not seen in the present study.[15] Seify has reported that the risk of capsular contracture increases with follow-up time, regardless of type, filler material (textured versus smooth) or surface of implant.[14.]

Independent review bodies have evaluated the available data on silicone breast implants and concluded that there is no convincing evidence of an association between implants and breast cancer, connective tissue diseases, other rheumatic conditions or neurologic disorders. Concerns regarding potential health effects of silicone breast implants have recently shifted from long-term illnesses to postoperative local complications.

**Limitations of the present study**

This study is limited by small sample size, not large enough for a representative data and short length of follow-up. The present study had a post-operative follow-up period of only 6 months. A longer period of follow-up may yield results like the rates for key

complications (i.e. contracture, reoperation, explantation and rupture) as reported in other long-term studies.

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Original Article

# Trends of Fast Food Consumption in Medical Students of Government and Private Medical Colleges of Rawalpindi / Islamabad A Comparative Cross Sectional Study

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**ABSTRACT**

**Objective:** Fast food consumption is increasing nowadays especially in the students, leading to many non-communicable diseases. This study is an attempt to determine the trends of fast food consumption among the medical students of Rawalpindi and Islamabad.

**Methodology:** It was a comparative cross-sectional study, done in government and private medical colleges of Rawalpindi/Islamabad, Pakistan within the duration of 6 months (March 2015 to August 2015). This study included 214 medical students from government and 222 medical students from private colleges. Probability simple random sampling technique was used to collect the data. Structured close ended questionnaire was filled by all these medical students. Data analysis was done between the government and the private medical students, using SPSS version 22. Chi-square was applied and p-value <0.05 was considered significant.

**Results:** Our study results showed that there is an increased fast food intake in the students especially after getting admission in the medical colleges. The participants had the knowledge that unhealthy food practices and habits could impose health risks later in life and could be passed onto next generation. Our striking finding was increased fast food consumption in hostel residing medical students, mainly because of poor food quality at hostel and free home delivery.

**Conclusion:** Our study revealed that there is an increased fast food intake in the medical students.

**Keywords:** *Obesity. Medical students. Non-communicable diseases.*

## INTRODUCTION

Fast food is defined as a food which is readily available, inexpensive, may or may not be nutritious, can be eaten at outlets, may be taken out or delivered.[1] Some examples of fast food include pizza, burgers, fried chicken, hot dogs, doughnuts, chips and beverages.[1-3] Such foods contain more calories, more salt, have a higher content of saturated fat and contain less iron, calcium, good fat and dietary fiber.[2,4] Fast food consumption has been linked with many non-communicable diseases (NCDs).[2,4]

Fast food restaurants have become very popular because they take less time, are convenient and the food tastes good.[3-6] Consuming large amounts of fast food leads to many adverse effects on health and is associated with a dramatic decrease in milk, fruit and vegetable intake.[4,6] Eating away from home is an accepted norm today especially when socializing with peers, colleagues, friends or family; or simply for pleasure eating.[3,7] Higher income, rapid urbanization, free home deliveries, advertisements and international cuisines have contributed to a rising trend in fast food intake.[3,7]

In the developing countries, the burden of NCDs has become a major public health concern. It is attributed to the unhealthy lifestyle which includes unhealthy dietary habits, physical inactivity, overweight/obesity and smoking.[3,8,9] Fortunately, these diseases are preventable.[10] A strong association lies between NCDs and lifestyle habits including binge eating.[9,10] These diseases impact wellbeing, cause dreariness and mortality.[11]

Around 73% of global mortality may be accounted for NCDs by the year 2020.[8] It is estimated by WHO that 40% of deaths in developing countries are caused by NCDs.[8] The most common NCDs of concern are cardiovascular diseases (CVDs), hypertension, osteoporosis and diabetes; CVDs being the first cause of mortality worldwide.[8,10] Obesity is a global epidemic and a risk factor for NCDs especially CVDs.[9] NCDs were responsible for 21% of premature deaths in 2014 in Pakistan.[12]

The younger generation is prone to rapid increase in weight and obesity, usually in low and middle-income countries which may lead to a huge burden of chronic diseases in the next two decades.[13] An individual's

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*Received: September 9, 2015; Accepted: November 24, 2015.*

behaviour changes after being admitted to a college or a university.[10] This is why students should be taught about health and nutrition at all academic levels. Studies have shown that only few students had healthy dietary intake while majority had an urge to learn about healthy diet.[10] Many students are involved in unhealthy lifestyle habits, mainly due to lack of time or stress during college life, like skipping breakfast especially.[2,10]

Medical students have more awareness about healthy lifestyles and dietary habits, but they hardly apply it to themselves, showing signs of early risk factors for chronic diseases. It is a matter of concern because it may cause problems in their future lives.[10,13] Students go through a major change in lifestyle, increased responsibilities, adapting to a new environment as well as a notable change in study material during the first year of medical college.[1,5,14] This may lead to stressful conditions which may be harmful to a student's health. A sound mind is necessary for a physician in order to treat patients as well as dealing with personal issues. Therefore, it is extremely important to teach them about the management of stress.[1,14] Improper eating behaviour can often tell if a medical student is under stress or not.[10]

It is usually seen that students living at home consume more fruits and cooked/raw vegetables than those residing outside the home.[5,15] Parents inspire their children's food intake positively by being a role model and by providing a proper food environment at home.[15] Those living away from home may develop more unfavorable eating habits.[14] Financial limitations, lack of transport, less cooking facilities and laziness outside home plays a huge role in this respect.[15]

The aim of this study was to compare the trends of fast food consumption among the medical students of government and private medical colleges. Students usually don't pay attention to their eating habits, which affects their lives in tremendous ways. The hypothesis was established that when a student gets into medical college, their diet patterns change dramatically, especially among those studying in private medical colleges.

## METHODOLOGY

Two hundred and fourteen medical students from government and 222 medical students from private colleges which made a total of 436 medical students from medical colleges in Rawalpindi/Islamabad, Pakistan were enrolled in this study.

This comparative cross-sectional study was conducted in government and private medical colleges of Rawalpindi/Islamabad, Pakistan for a duration of six months (from March 2015 to August 2015).

Structured close ended questionnaire was filled by all these medical students after taking the informed consent. Approval was taken from the ethical review committee of our medical college.

Comparative data analysis was done between the government and the private medical students, using SPSS version 22. Standard descriptive and analytical statistics were used to analyze the data. Chi-square test was used to ascertain the association between qualitative variables and the p-value less than 0.05 was considered significant.

## RESULTS

The results show that most of the students 279 (64%) both from the private and public medical colleges fall in the normal body mass index(BMI) category (Figure 1). Around 54% students of government medical colleges prefer to live in hostel as they are from other cities, whereas 40% students of private medical colleges live in hostels (Table 1). As the study was done on the medical students so they were well aware of proper and healthy diet. Most of them realise their diet to be unhealthy, which has increased since they have joined medical colleges (Table 1). Students perceive it unhealthy because it can cause diseases like diabetes, hypertension, weight gain etc.

Around 58% students of government medical colleges and 65% students of private medical colleges consume fast food just for taste and not as a status symbol which is usually perceived. Majority of the students (71% from government colleges and 60% from private colleges) preferred fast food when in the company of friends.

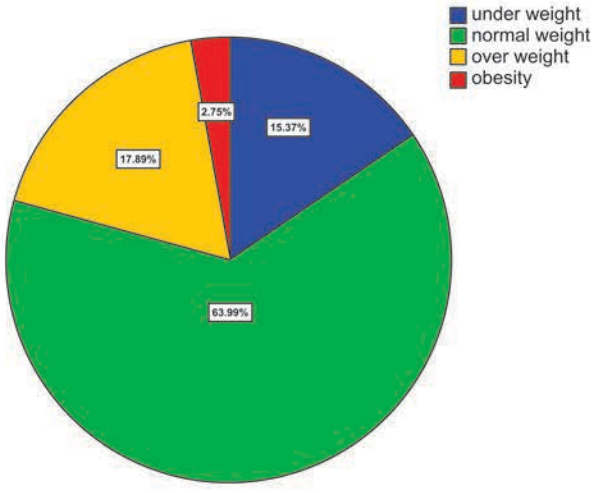


**Figure 1: BMI categories of the medical students**

Average amount of money spent on fast food by the students of private medical colleges living in hostel, in a week, is more than Rs. 2000 that much more than the students of government colleges (p-value =0.010).

Around 65% government medical college students and 60% private medical college students agreed that their urge for fast food increased when they felt positive i.e. happy, excited etc. (table 2) (p-value = 0.464).

**Table 1: Comparison between government and private medical colleges**

| Variable | | Government Medical College n (%) | Private Medical College n (%) | p-value |
|---|---|---|---|---|
| **Where do you live** | College Hostel | 101 (23) | 65 (15) | 0.001 |
| | Private Hostel | 14 (3) | 23 (5) | |
| | Day Scholar | 99 (23) | 134 (31) | |
| **Do you think proper diet is necessary** | Yes | 196 (45) | 202 (46) | 0.825 |
| | No | 18 (4) | 20 (5) | |
| **Do you feel your diet is healthy?** | Yes | 95 (22) | 119 (27) | 0.958 |
| | No | 98 (23) | 124 (28) | |
| **Do you think fast food is healthy** | Yes | 31 (7) | 27 (6) | 0.475 |
| | No | 183 (42) | 195 (45) | |
| **Do u think fast food consumption has increased since you joined medical college** | Yes | 111 (25) | 149 (34) | 0.001 |
| | No | 103 (24) | 73 (17) | |
| **How many times you used to eat fast food before joining medical college** | Once a week | 63 (15) | 67 (15) | 0.001 |
| | More than once a week | 31 (7) | 65 (15) | |
| | Almost everyday | 6 (1) | 8 (2) | |
| | Not so often | 114 (26) | 82 (19) | |
| **How many times you used to eat fast food after joining medical college** | Once a week | 72 (17) | 50 (11) | 0.000 |
| | More than once a week | 80 (18) | 117 (27) | |
| | Almost everyday | 27 (6) | 43 (10) | |
| | Not so often | 35 (8) | 12 (3) | |
| **Do you consume fast food to replace routine meals** | Yes | 124 (28) | 142 (33) | 0.198 |
| | No | 90 (21) | 80 (18) | |
| **Does branding has an effect on increased consumption** | Yes | 153 (35) | 150 (34) | 0.373 |
| | No | 61 (14) | 72 (17) | |
| **Are you aware that excess fast food consumption can cause several diseases** | Yes | 193 (44) | 194 (45) | 0.355 |
| | No | 21 (5) | 28 (6) | |

**Table 2: Student's preference with reference to the place they live**

| Variable | | Where do the students live | | | p-value |
|---|---|---|---|---|---|
| | | College hostel n (%) | Private hostel n (%) | Day Scholar n (%) | |
| **Do you prefer fast food because of free home delivery** | **Yes** | **107 (24)** | **25 (6)** | **90 (20)** | **0.000** |
| | **No** | **59 (14)** | **12 (3)** | **143 (33)** | |
| **Do you think fast food consumption has increased since you got admitted in the medical college** | **Yes** | **105 (24)** | **22 (5)** | **133 (31)** | **0.464** |
| | **No** | **61 (14)** | **15 (3)** | **100 (23)** | |

## DISCUSSION

This current study was done on medical students of Rawalpindi and Islamabad about trends of fast food consumption. Students from both private and government setups were included in study sample without academic year specification.

Our study proved that increased fast food consumption amongst medical students is because of many factors that are associated with their lifestyle. Hostel residing students consume more fast food as compared to day scholars in both setups, which can be because of various reasons. The results show that factors like increased number of restaurant and different services availability, for example, free home deliveries have a statistically significant relationship with the likelihood of student's frequent fast food consumption as well as branding and persuasive advertisements of food items are also in the lime light.

A significantly high number of students are aware that fast food causes weight gain and leads to many serious long-term health problems. We found that being medical students and despite being well aware of fast food havocs, they are still keenly consuming fast food, reasons might include: being a resident of a hostel, free home delivery, advertisement, branding or mood.

It was also observed in this study that fast food consumption of few students increases when they are feeling very low or on the other end, feeling very happy. Similar findings were seen in a study was done in Karachi and other done in three European countries to find out the relation between stress and fast food consumption which proved that many students increase their fast food consumption when they are stressed, particularly among them are females.[11,16]

Our study highlighted that majority of the parents allowed their children to consume fast food which was also seen in a study done by Nighat et al.[13] Role of parents in keeping a check on their children's diet is not appreciable. Some candidates said that their parents do not allow them to eat junk food due to the disliking of parents towards their child's increased consumption of fast food, and most of them said that their parents are not aware of their junk eating habits, because if they got to know it, they would never allow them to take such kind of unhealthy food and they also considered it a waste of money.

Our findings of trends leading to increased fast food consumption are supported by different studies, held in different medical institutes of other countries. A study in Greece displayed that students living at home did not show major changes in their eating habits since starting University.[5] Students living away from the family and home had made some negative changes, they decreased their weekly consumption of fresh fruit, cooked and raw vegetables, oily fish, seafood, pulses and olive oil, and increased their fast food intake.[4-6] Also in our study, it was seen that students living in hostels have increased their fast food consumption while decreasing fruits intake. Many other studies have also proved that fast food advertisements and branding are amongst major tempting factors that have led to increased fast food consumption, like a study done in India showed that advertisements of unhealthy food have led to increased fast food consumption which was also seen in our study.[3,7,18]

It was seen in our study that students hardly pay attention to the nutritional components of the food they consume. This was also seen in a study conducted in India and USA, showing that majority of their sample population preferred fast food, 25% being unaware of the nutritious facts because they didn't check the labels.[2,18] Majority were unaware of the chemicals present and the composition of the junk food.[2]

A study held among Iranian students showed that many agreed that good nutrition was important for good health. But a majority were inclined towards fast food and had less intake of traditional food due to a vast variety of food choices and advertisements.[17] Similar kind of findings were seen in our study too.

Our study showed that a majority of the sample population lied in the normal weight category, a small percentage was overweight and only a few were categorised as obese. These findings are different from studies done in the USA which showed a positive association between fast food consumption and overweight status.[19,20] A study conducted in Lahore and Faisalabad showed that 89% preferred fast food over fine dining or cooking at home.[14] About 70 per cent agreed they thought consuming fast food led to obesity. Approximately 70% said the reason for eating fast food was convenience.

Our study was limited to the trends that led to fast food consumption, but we found out that stress is strongly leading to fast food consumption specifically amongst medical students because of their hectic routine and burden of studies. Future studies can focus on effects of stress on lives of medical students and fast food consumption.

## CONCLUSION

Our study revealed that there is an increased fast food intake in the medical students. Unhealthy food practices and habits could impose health risks later in life and could be passed onto next generation. There is increased fast food consumption in hostel residing medical students and for that, health education is the most effective step to be taken.

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Original Article

# Outcome of Primary Repair and Nerve grafting in Peroneal Nerve Injury

Naveed A. Khan, Ijaz shah, Abrar ul Hassan Pirzada

**ABSTRACT**

**Objective:** The purpose of this study was to retrospectively evaluate the clinical and functional results of nerve grafting and end-to-end peroneal nerve repair between sciatic bifurcation and distal branching.

**Methodology:** The study was performed at Sheikh Zayed Hospital Lahore, included 26 patients (22 men, 4 women; mean age: 19.9 years; range: 5 to 46 years) who underwent peroneal nerve repair between 2004 and 2014. Open nerve injuries were seen in 21 patients and closed injuries in 5 patients. Surgical repair was performed with sural nerve grafting in 19 patients and end-to-end in 7 patients. Mean nerve graft length was 5.42 (range: 2 to 15) cm with a mean 3.1 (range: 2 to 4cm) nerve cables used. Mean follow-up was 33 (range: 13 to 96) months. The British Medical Research Council scale was used for the evaluation of the tibialis anterior and peroneal muscles and Semmes- Weinstein monofilaments were used for protective sensation-evaluation.

**Results:** Adequate and full recovery were observed in 19 patients (73%). Mean follow-up time was 39.3 months in patients undergoing nerve grafting and 30.1 months in end-to-end nerve repair. Fifteen of 19 patients with nerve grafting and 4 of 7 patients with end-to-end nerve repair had an adequate or full recovery. Posterior tibial tendon transfer to dorsal foot was done in 3 of 7 patients without recovery. Protective sensory recovery was determined in 16 of 22 patients.

**Conclusion:** Good results in both end-to-end repair and in repair with grafting is possible in peroneal nerve repair.

**Keywords:** *Nerve grafting. Peroneal nerve injury. Epineural repair.*

## INTRODUCTION

Peroneal nerve injuries are most commonly found in the lower extremity.[1] Etiology varies greatly, from penetrating injuries, gunshot wounds and knee traumas to iatrogenic injuries.[1-4] The tibialis anterior (TA), peroneus longus (PL), peroneus Brevis (PB), peroneus Tertius (PT), extensor hallucis longus (EHL) and extensor digitorum longus (EDL) muscles, innervated by the peroneal nerve, are generally affected following injury. Due to severely limited post injury ankle dorsiflexion, drop foot deformity commonly occurs and, in turn, affects patient's ability to walk. Additionally, dorsal foot sensation is also impaired.

After peroneal nerve injuries, the aim of treatment is to recover ankle dorsiflexion. However, there is currently no consensus on recovery following nerve repair in the literature. Some studies have reported poor recovery results and the posterior tibial tendon (PTT) transfer is recommended with or without nerve repair.[5-7] Roganovic reported that the recovery potential of the peroneal nerve is worse than the other peripheral nerves.[8] On the other hand, a large series from Louisiana State University has shown that good repair results can be achieved.[9]

The aim of this study was to retrospectively evaluate the results of sural nerve grafting and end-to-end repair after peroneal nerve injuries from the sciatic nerve bifurcation throughout the common peroneal nerve (CPN) and its branches.

## METHODOLOGY

Twenty-six patients (22 men, 4 women; mean age: 19.9 years; range: 5 to 46 years) who underwent peroneal nerve repair between 2004 and 2014 were retrospectively evaluated. End-to-end epineural nerve repair was performed in 7 patients and repair with sural nerve graft in 19 patients.

Open nerve injuries occurred in 21 patients (81%) and closed nerve injuries in 5 patients (19%). The injury was caused by; penetrating injury in 16 patients, gunshot wound in 3 patients, work accident in 2 patients and traffic accident in 5 patients. Nerve injuries were also accompanied by knee dislocation in 1 patient, fibular head avulsion fracture in 1 patient and lateral collateral ligament (LCL) injury in one patient.

Patients were placed in prone position and both lower extremities were prepared under tourniquet control. The first part of the vertical incision was broad S-shape and began in the short head of the biceps muscle. A broad portion of the incision crossed the fibular neck so that it could be better explored. The

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*Received: August 10, 2015; Accepted: November 25, 2015.*

short head of the biceps muscle was elevated and moved laterally away from the CPN, giving a much clear visual inspection. The dissection was continued to the lateral popliteal space where the nerve passed under the fibula. The nerve dissection was continued by cutting the lateral gastrocnemius fascial extension and soleus muscle. Whether the CPN branched into deep and superficial branches or not was recorded. The injuries in all our patients were above this level. The posterior edges of muscles and peroneal fascia were explored by sharp dissection.

The peroneal muscles were retracted laterally and inferiorly to provide better visualization of the superficial peroneal nerve. A Penrose drain was placed around the superficial CPN and the deep branch was reached. During dissection, small vessels were sealed by bipolar cautery.

The nerve was dissected proximally and distally until healthy nerve endings in the injured area were located. End-to-end epineural nerve repair was performed in 7 patients with 8/0 non-absorbable sutures where there was no tension between healthy proximal and distal nerve endings. In 19 patients where the end-to-end repair was not possible, group fascicular nerve repair was performed with 8/0 non-absorbable sutures by placing an interpositional sural nerve graft taken from the opposite leg. The sural nerve graft length on average was 5.42 (range: 3 to 15) cm. The average number of cables used was 3.1 (range: 2 to 4).

The average duration of injury and surgical intervention was 28.9 (range: 1 to 180) days. Primary (first 3 days) or delayed (4 to 7 days) nerve repair was performed on 12 patients and secondary (after the 7th day) nerve repair was performed on 14 patients. A long leg splint with the knee flexed at 30 degrees was used for 3 weeks in patients without other injuries (93%). Following splint removal, a peroneal paralysis orthosis was applied until active ankle extension began. The British Medical Research Council (BMRC) scale was used to evaluate peroneal nerve repair.[2] Recovery of TA and peroneal muscles were determined as full in patients with M4-M5 muscle strength classification, satisfactory in patients with M3, fair in M1- M2 patients and poor in M0 patients. The Semmes- Weinstein monofilament test was used to evaluate recovery of sensation for the first dorsal web space. Patients scoring a minimum of 4.56 were considered to have a recovered sense of protection (Table 1).[10] This study was approved by Hospital Ethics committee. Informed consent was taken from all patients.

## RESULTS

The muscle strength obtained from TA and PB-PL at the end of surgical treatment are presented in Table 2. Adequate and full recovery occurred in 19 patients. M2 muscle strength was seen in 3 patients, M1 in 2 patients and M0 in 2 patients. Adequate and full recovery was observed in 15 of 19 patients with grafted nerve repair at the end of an average 39.3 months of follow-up. Of these patients, two patients had M2 muscle strength and two had M0. In the 7 patients who underwent end-to-end nerve repair, adequate and full recovery was seen in 4 patients after an average follow-up of 30.1 months. Of these, one patient had

**Table 1: The British Medical Research Council and Semmes Weinstein sensation test criteria**

| | The British Medical Research Council Weinstein monofilament scale for muscle strength scale | Semmes - test | |
|---|---|---|---|
| M5 | Normal power | Group1(2.83-3.61) | Normal |
| M4 | Movement against gravity and resistance | Group2(4.31) | Diminished light touch |
| M3 | Movement against gravity(noresistance) | Group3(4.56) | Diminished protective sensation |
| M2 | Movement with gravity eliminated | Group4(5.07) | Loss of protective sensation |
| M1 | Flicker | Group5(6.65) | Not test able |
| M0 | Total paralysis | | |

**Table 2: Muscle strength results of surgical treatment methods**

| | M5 | M4 | M3 | M2 | M1 | M0 | Total | G1 | G2 | G3 | G4 | G5 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Graft repair | 6 | 6 | 3 | 2 | 2 | - | 19 | 3 | 5 | 4 | 2 | 1 | 15 |
| End-to-end repair | 2 | 2 | - | 1 | - | 2 | 7 | - | - | 4 | 1 | 2 | 7 |
| Total | 8 | 8 | 3 | 3 | 2 | 2 | 26 | 3 | 5 | 8 | 3 | 3 | 22 |

M2 muscle strength and 2 patients had M0 and one patient underwent reoperation since no recovery was determined in the 20th month.

The functional restoration was performed in 3 patients who still presented inadequate ankle dorsiflexion strength by transferring PTT to the dorsum of the foot after a minimum of 2 postoperative years.

In the sensorial evaluation, the protective sensation was recovered in 16 of 22 patients in the dorsal area of the first web space. The protective sensation was regained in 12 of the patients with nerve grafting and 4 patients with end-to-end nerve repair (Table 2).

## DISCUSSION

Fewer studies regarding the treatment of lower extremity nerve injuries have been reported than those regarding upper extremity injuries. Although easy to clinically diagnose, the published results of surgical treatment of peroneal nerve injuries vary.[3,5-8]

Clawson and Seddon reported 36% motor recovery in 72 patients with peroneal nerve repair.[5] Millesi performed neurolysis on 13 of 44 patients and observed full recovery.[2] On the other hand, poor functional results were observed in 2 patients with end-to- end nerve repair. Kim and Kline, in their series of 218 CPN injuries, obtained good results in 16 of 19 patients who underwent end-to-end nerve repair.[3] In our study, 4 of 7 end-to-end nerve repair patients obtained muscle strength of M3 or above. One patient showing no recovery after end-to-end nerve repair underwent PTT transfer.

The mobility and elasticity of the peroneal nerve are lower than in other peripheral nerves. Therefore, nerve grafting is often preferred, with the sural nerve most commonly used as a donor. Wood noted that the ipsilateral sural nerve should be removed only if the sensory function is damaged and the sural nerve graft taken from the opposite leg if sensory function ipsilaterally is saved.[7] Many studies have reported poor clinical recovery post grafting than following end-to-end repair. Millesi determined functional recovery in 16 of 29 patients undergoing repair with nerve grafting and suggested direct PTT transfer with grafted nerve repair or without any nerve repairs in the selected patients.[2] Matejcík performed operations on 40 patients and obtained functional recovery in 3 of 12 patients who underwent nerve grafting.[11] It was noted by Matejcík that the longer a nerve graft is, the worse the clinical results were. However, there is still no consensus on critical length affecting result of nerve repair. Kimand Kline reported recovery rates following nerve grafting 50% worse than end-to-end nerve repair.[3] They determined motor recovery rates of 75%, 38%and 16% in the patients undergoing nerve repairs were performed with grafts of lengths shorter than 6 cm, 6 to 12 cm and 13 to 20 cm, respectively. In a 157 patient group with sciatic and peroneal nerve injury caused by gunshot wounds, Roganovic noted success rates of 57%, 22.4% and 40% using nerve grafts of lengths 4 cm or shorter, 4 to 8 cm, and longer than 8cm, respectively.[12] On the other hand, Durandeau et al. obtained good results with nerve grafts shorter than 5 cm and between 5 and 8 cm performed for personal nerve traction at the knee level.[13] We determined full and adequate recovery in 78% of patients with grafted nerve repair shorter than 6 cm. Although few patients had long graft nerve repair, the results obtained are comparable to those of Kim and Kline and Durandeau et al.[3,13] Additionally, 3 of 4 patients with 6cm or larger grafts achieved full or adequate recovery.

The cause of nerve injury is among the principle factors affecting recovery. End-to-end nerve repair is the first option in peripheral nerve injuries caused by sharp cuts. Compared to grafted nerve repair, the result of end-to-end nerve repair appears less problematic.[14-15] In our study, 11 of the 16 patients injured by sharp cuts underwent end-to-end nerve repair and satisfactory to full recovery was observed in 13 of these patients. However, extreme distension caused by high energy traumas (such as gunshot wounds and traction type injuries with or without fracture) leads to intraneural and extraneural scarring and affects a larger nerve segment than the primary nerve injury area.

Therefore, high energy nerve injuries are often repaired by nerve grafting. Sedel and Nizard performed CPN grafting on 16 patients with personal nerve injuries caused by traction. [16] Five of 9 patients recovered free from any significant walking or running problems without performing PTT transfer. In our study, nerve graft repair was performed on 7 patients with high-energy trauma, 5 of which achieved a muscle strength of M3 or above.

The main aim of surgical treatment in peroneal nerve repair is to restore function in patients with drop foot deformity. Although orthosis is recommended, long-term problems can occur when there is no reinnervation. PTT transfer can be performed on patients presenting with bad prognosis or patients who cannot be accommodated through less intrusive means. Millers recommends primary tendon transfer in elderly patients with nerve defects or those who have delayed repair for 3 months.[2] Irgit and Cush recommend direct tendon transfer in patients with nerve defects over 6 to 8 cm or in the 6 to 9th month of injury.[17] Some studies state that tendon transfer accelerates nerve recovery due to the internal rehabilitation effect.[18] Sedel et al. recommend tendon transfer 2 years and 1 to 1.5 years after nerve repair, respectively.[16-19] Our opinion is to perform tendon transfer one year after end-to-end repair or 2 years after grafted nerve repair.

In our study, functional restoration with PTT transfer was performed on 3 patients. When a peroneal nerve function disorder occurs in an open injury, the nerve needs to be revealed by early surgery. When this occurs in blunt traumas or sutured laceration, it is recommended to wait for 2 to 8 months before surgically exploring the nerve.[7, 11, 17] However, some authors recommend tendon transfer after 6 to 8 months.[2, 20] These situations greatly affect the decision making of the surgeon with regard to surgical timing. Ultrasound can be used to asses peripheral nerve continuity and to aid clinical diagnosis.[21, 22] We recommend exploring the nerve surgically in closed or sutured laceration when the coherence of ultrasound and the nerve cannot be determined. In conclusion, good results from end-to-end repair and small grafts shorter than 6 cm can be obtained in the treatment of peroneal nerve injury between the sciatic bifurcation and distal branching. PTT transfer in patients without any nerve recovery in order to recover ankle dorsiflexion at the end of a 2-year observation period can be recommended.

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Photo Essay

# Osteoplastic Thumb Reconstruction

Naveed A Khan, Farooq Azam Khan, Ijaz Shah

## INTRODUCTION

Attempts to reconstruct the thumb span the history of hand surgery. Techniques of phalangisation, osteoplastic thumb reconstruction, pollicization, and even pedicled toe transfers have been in existence for a hundred years.[1] The attributes that make the thumb surgery unique, and that the reconstructive surgeon must assess and try to restore when reconstructing a thumb are: Position, stability, strength, length, motion, sensibility, and appearance.[2] Osteoplastic reconstruction of the thumb is indicated in amputation at or around metacarpophalangeal level in patients who cannot, or will not, have a toe transfer.[3] However, in many situations, patients might be reluctant to sacrifice a toe for reconstruction of the thumb. In countries where thong sandals are the main footwear, loss of second or great toe might be viewed as unacceptable deficit.[4] Cultural issues regarding loss of another digit or toe might also play a role in patient's decision making. Osteoplastic reconstruction, although inferior in cosmetic outcome, does not require sacrifice of another finger or a toe and also does not need microsurgical expertise.[5]

- 25 year-old right-handed male mechanic by profession.
- Presentented in ER
- Right thumb and index finger were trapped and crushed between two hard surfaces
- Initially managed by orthopaedics department
- Multiple debridments were done

- Avulsion of skin and soft tissue at the metacarpophalangeal joint of thumb
- Long flexors of index finger were cut.
- The bone was crushed proximal to metacarpophalangeal joint with the extensor and flexor tendons detached from its muscolo-tendonous junction.

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*Received: September 10, 2015; Accepted: November 20, 2015.*

Illiac crest bone Graft

As Lister has suggested that the fit of the graft peg into the metacarpal should be tight enough to enable lifting of the arm by the graft after insertion

Insetting of Groin Flap.

Division Of Groin Flap

Tendon Grafting for flexor tendon reconstruction of index finger

Final Results After six Months

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