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Journal of Islamic International Medical College

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EDITORIAL

How much do Pakistanis Care about Oral Health?

Muhammad Humza Bin Saeed

When Pakistan came into being back in 1947, we had only 250 hospitals and no basic health units (BHUs) or Rural Health Centres (RHCs) at all. There were a total of 6500 doctors, out of which only 600 were dentists.[1] Today, 68 years down the line, the situation albeit not matching those of developed nations is however, much better than what it was about 7 decades ago. We have about a 1000 hospitals all over Pakistan, in addition to 5300 BHUs and about 600 RHCs. There are a total of 165,000 doctors out of which 15000 are dentists.[1,2]

The reason that I have stated these statistics is to elicit the current oral health status of Pakistanis in the perspective of the health care system. What we need to understand is the fact that these 15,000 dentists are all we have to facilitate a population of about 200 million, giving a ratio of 1 dentist for 13,000 people. Let us readjust these figures to account for some practical issues. As per Tudor Hart's inverse care law which elicits the inverse relationship between the demand and supply of health needs and health professionals, we may very well appreciate the fact that the majority of these dentists are practicing in the urban areas, which house only about 30-35% of the Pakistani population. To make the situation worse, 62% of the dentists' population are female, a large proportion of whom do not even practice dentistry and those who do, generally do not prefer to work in rural areas. So, if we were to estimate that in the rural areas of Pakistan, 1 dentist serves a population of 20,000, we would not be pushing it too far.

This bleak picture of the oral health care system in Pakistan is an actual reality. Given the extremely limited access a Pakistani person has to oral health care services, one would not be too optimistic regarding the oral health of the nation. Although, we do not have any recent nationwide statistics to elicit the average oral health status, several studies reporting oral health statuses of small samples of Pakistanis show that carries and periodontal diseases are quite high.[3-5] Furthermore, people usually report to the dentist only when their teeth have become grossly carious.

Another fact that needs to be considered is that Pakistan does not have an independent oral health policy at the national or provincial level. There are no vacancies for dentists on any of the health policy making bodies. Also, there are no considerations for oral health in any of the future health proposals. If we take the government's 'Vision 2030' as an example, the plan does contain a chapter on health. However, oral health has not been taken into consideration at all.[6]

All of the above mentioned indicators suggest that oral health is not really perceived as being very important in Pakistan, both by the government and by the masses. In order to maintain good oral health, it is imperative that people consider oral health to be important for their overall general health. As former US Surgeon General C. Everet Koop said:

"If you do not have oral health, you're simply not healthy"[7]

If people do not consider oral health to be important, the implications of such perceptions and beliefs would be expected to be reflected on the general health as well. Similar to general health, oral health trends also follows a social gradient. With more than 60% of Pakistan's population belonging to the lower socioeconomic class, the expected oral health indicators would also not be very favorable. To add to this situation, oral health education campaigns are almost non-existent across the country. Different health care auxillaries working in the field, such as the Lady Health Workers, are not trained in oral health and hygiene education. Subsequently, the motivation or education that the general public receives regarding oral health and hygiene is through media advertisements, which do not always provide evidence based information.

Based on these facts, it may be deduced that the general Public's apathy towards oral health, may be explained mostly by the lack of government policies to address oral health in Pakistan.

Pakistan's public health capacity to address oral health is limited. Oral health needs to be there on the governments' public health priority list. Dental schools should incorporate community based oral

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health education in their curriculum. Oral health education awareness programs should be planned at a national level. As time is passing, Pakistan's previous dental force is slowly being replaced by younger energetic dentists who have a new zeal and energy to work. With young dentists with a broader vision coming up in Pakistan, the future will hopefully hold hope for improved oral health care in Pakistan.

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ORIGINAL ARTICLE

Oral Health and General Health in Children Having Intellectual Disabilities: A Cross Sectional Study

Maryam Rehman, Ridha Humayun Kabir, Anum Zehra, Noor Fatima, Komal Syeda

ABSTRACT

Objective: This study aimed to assess the correlation between oral health and general health in children having intellectual disabilities.

Study Design: Cross-sectional, questionnaire based study.

Place and Duration of Study: This study was conducted at Step to Learn School, Islamabad and Rawalpindi, fromMay to June 2014.

Materials and Methods: A sample of 88 children were selected from two branches of 'Step to Learn', a special school for children with intellectual disabilities. Body Mass Index (BMI) was used to assess general health, while oral health was measure by the Decayed, Missing, Filled Teeth (DMFT) index. Dental surgeons and dental students conducted the examination. Pearson's correlation coefficient was used to compare the correlation between BMI and DMFT. The data was analyzed using the software SPSS (v 17.0).

Results: Out of 88 children, data of 85(96.59%) was recorded. No significant correlation was found between oral health and general health (r = -0.06).

Conclusion: The general health of children with intellectual disabilities does not impact their oral health. Subsequent oral and general health educational initiatives should be conducted separately.

Key Words: *Intellectual disabilities, General Health, Oral Health.*

Introduction

Intellectual disability is a generalized disorder appearing before adulthood characterized by significantly impaired cognitive functioning and deficits in two or more adaptive behaviors. It is classified as an Intelligence Quotient score of under 70 and further categorized as mild, moderate, severe and profound.[1-3] Disability is a general term that includes impairments, activity confinements and participation restriction. Impairment is a problem in body function or structure; an activity confinement is a difficulty faced by a person in performing a task or an action while participation restriction is a problem experienced by a person in life situations.

Previous studies have reported that the children with intellectual disabilities have similar incidence of caries and more frequent extractions as compared to the general population, still they have a higher level of unmet dental needs.[4-6] Numerous international studies have highlighted the importance of oral hygiene in children having intellectual disabilities;[3-5] however, very few studies have been conducted on this issue in Pakistan. Studies have also shown that oral health is the most ignored angle for these people.[7] General health conditions are apparently more important than oral health as the connection between oral and general health is not properly apprehended.[8,9] This is further substantiated by the fact that oral health problems have been reported to be in the top ten secondary conditions among the childrenwith intellectual disabilities. Such children are more vulnerable and socially excluded in the society.[4]

In Pakistan, there is a paucity of oral health care services for children with intellectual disabilities. The major barriers are described by using Penchansky and Thomas: Model of Access, five themes of which are availability, accessibility, accommodation, affordability and acceptability.[5,9,10] Availability measures the degree to which the dentist has the resources such as personnel and technology to meet the needs of these children, e.g. in Pakistan, the ratio of dentists to population is small and no department is available to specifically cater for the needs of these children. Accessibility determines the geographical location of the dental clinic and how conveniently the client can reach there. Another aspect is

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whether the client can physically access the premises e.g. children with impaired physical health have difficulty in climbing the stairs but elevators are not frequently available Accommodation reflects the willingness of the dentist to prioritize the needs of these children e.g. there is no particular department with extended opening hours to accommodate these children or which schedules an appointment as per convenience. On top of that, the dentists usually hesitate in accepting the case. Affordability refers to the socioeconomic status of the children's families and the fee of the dentist e.g. the oral health care services are very costly thus making it unaffordable for children with intellectual disabilities from lower strata of society.[5] Finally, acceptability depicts the comfort level of these children and the dentists regarding the treatment. The dentists are unequipped for such cases and their hesitation increases the anxiety level of these children.

The children with intellectual disabilities should be given equitable care as is the moral and professional obligation of the dentists. They share the same entitlement to good oral health as the rest of the society.[1]

Although a few studies have been carried out to assess the correlation between the general and oral health of intellectual disabilities, the evidence available is limited. Also, this correlation has not been investigated among individuals with a South Asian ethnicity. The aim of this cross sectional study was to assess any correlation between oral health and general health in children having intellectual disabilities.

Materials and Methods

This cross-sectional study set out to assess the association between general and oral health. For the purpose of data collection, a school for children with intellectual disabilities, 'Step to Learn' (STL) was selected. STL has two branches: one in Islamabad and the other in Rawalpindi. A dental team comprising of dental surgeons and dental students from Islamic International Dental College (IIDC) visited the two branches of STL for data collection.

The two branches of STL had a students' strength of about a 100 students. The dental team visited the two branches on two separate days. Before the dental visit, the school administration obtained informed consent from the students' parents.

Caries, experience, measured using the 'Decayed, Missing and Filled teeth (DMFT) index was used as an indicator for oral health. The DMFT is a validated index for the assessment of dental caries that has been used for measuring caries experience for about a century[11] To measure general health, BMI was used.

The examination was carried out by the students. Each station was assigned a particular task. One of the stations was allocated to calculate the BMI using a commercial weighing scale and measuring tape. Three stations were designated to check the DMFT using tongue depressors and torches. For behavioral management, positive reinforcements and Tell-Show-Do techniques were used e.g. after the children successfully let the dental surgeons examine their oral cavity and record weight and height they were given stickers. Students frequently demonstrated the use of weighing scale by getting up on it and the children were shown how DMFT is done by observing the process on another child.

Statistical Package for Social Sciences (SPSS v 17.0) was used to insert, consolidate and analyze the data. Mean and standard deviation were used to describe BMI and DMFT. Pearson's correlational analysis was used to analyze any association between BMI and DMFT.

Results

Our sample size compromised of 88 children out of which 29 (33%) were females and 59 (67%) were males.

Table I illustrates the frequency distributions of the various conditions of the children. Multiple disorders included children having more than one aforementioned condition along with growth retardation, cerebral palsy and physical

Table I: Distribution of the Conditions of Children

Conditions	Frequency (%)
Autism	43(49.4)
Down's syndrome	4(4.6)
Hearing and speech impairment	21(24.1)
Intellectual disability	3(3.4)
Multiple	16(18.4)
Total	87(100)
Missing	1
Total	88

BMI and DMFT of 85 patients were checked. The BMI frequencies have been illustrated in Table II. Three of the patients were non-compliant.

Table II: Frequencies of Ranges of BMI

BMI Range	Frequency (%)
Normal	25(29.4)
Underweight	55(64.7)
Overweight	4(4.7)
Obese	1(1.2)
Total	85(100)
Missing	3
Total	88

impairments. Condition of one of the children could not be specified.

DMFT Score was generally high as every child had a different limitation and this made the result variable. Two of the children had severe physical disabilities due to which BMI could not be calculated and one child was uncooperative. Majority of the children were found to be underweight. Interestingly, a greater part of the sample had a DMFT Score of zero. The DMFT Score of the obese child was zero. The overweight children had less DMFT Score than the underweight children while the DMFT Score of the children having normal BMI was found to be the highest. Since there was only one obese child, the result was not conclusive.

Table III illustrates the frequencies of DMFT scores. Three of the patients were non-compliant.

Table II: Frequency of DMFT Scores

DMFT Scores	Frequency (%)
0	40 (47.1%)
1	6 (7.1%)
2	14 (16.5%)
3	7 (8.2%)
4	4 (4.7%)
5	3 (3.5%)
6	3 (3.5%)
7	3 3.5%)
8	1 (1.2%)
10	1 (1.2%)
11	2 (2.4%)
12	1 (1.2%)
16	1 (1.2%)

The mean DMFT score was 2.15 +3.15, while mean DMFT score for children having normal BMI was calculated to be 2.92±3.70, the score of 1.89±3.03 was calculated for the underweight category, 1.50±1.29 for overweight and zero for the obese. (Fig I) The prevalence of dental caries in the sample was found to be 48.2%.

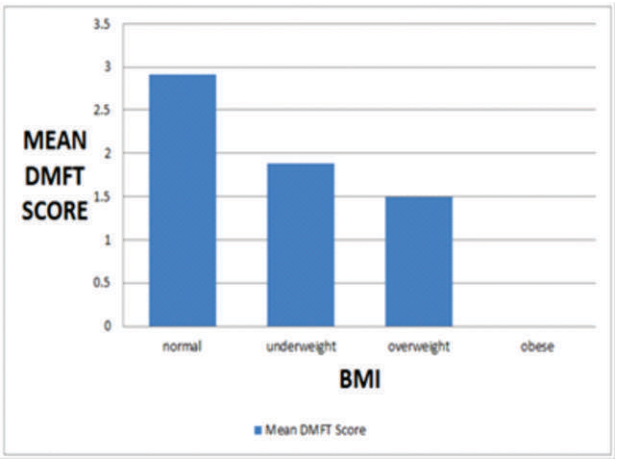

Fig 1: Mean DMFT Scores for Different BMI Categories

A very weak negative correlation was found between DMFT and BMI (r = -0.06).

Discussion

The present study found a very weak correlation between general and oral health of children with intellectual disabilities. Reasons for this could be that the sample size was too small and the DMFT score was low. Another factor could be that females are more prone to caries but this is not a universal phenomenon.[12]

The prevalence of dental caries in this sample was found to be 48.2% as compared to 53.5% found in children with intellectual disorders in Guangzhou, China[13] and 79.6% in young athletes with intellectual disorders in Indonesia.[14] The low dental caries prevalence in our study could be explained by our low sample size. Furthermore, our sample was selected from a private school where both the parents and care givers of the children reported paying special attention to the hygiene of children.

Male to female ratio was not accounted for throughout the study so this is not an accurate representation of this community. The sample size was too small to find any significant correlation or pattern between DMFT and BMI. Alternatively, oral health was well maintained. Results were inconclusive because some of the children had severe physical impairments which made them unable to get their heights and weight measured accurately. Therefore, the dentists used approximation for such cases. Additionally the DMFT score results proved to be an underestimation rather than overestimation. The children were provided

with tooth brushes and tooth pastes to encourage oral hygiene and good behavior. They were also demonstrated the correct tooth brushing technique. The parents were advised not to give too many sweets to the children as a reward for good behavior. They were also advised against regular snacking. The guardians and parents of these children were invited and their queries were facilitated. Moreover, they were given the contact details of the Islamic International Dental Hospital (IIDH) where they could be further accommodated.

The limitations of the study were that the participation of the students was low due to absence of registered students and apprehensions by a few as reported by the school administration. Furthermore, children with intellectual disabilities who do not attend school were not considered in this study. Therefore, socioeconomic status could have been a possible confounder for the study.

Conclusion

Since no correlation could be determined between oral and general health of children with intellectual disabilities, both should be dealt separately. Oral health and general health education for children with intellectual disabilities and their caregivers should be provided. It would be beneficial if educational programs covering basic items of oral health care are introduced to train the children as well as the parents and caretakers.[4,9,15]

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ORIGINAL ARTICLE

Prevalence of Domestic Violence among Pregnant Women Visiting Federal General Hospital Islamabad

Danish Nadeem[1], Saira Alyas[2], Waheed Iqbal[3], Jamal Zafar[4], Shahzad Ali Khan[5], Mudassar Mushtaq Jawad Abbasi[6]

ABSTRACT

Objective: To Estimate prevalence of domestic violence and associated risk factors among pregnant women attending the Federal General Hospital, Islamabad.

Study Design: Descriptive cross sectional study.

Place and Duration of Study: This research was conducted in the Federal General Hospital, Islamabad from May 2014 to October 2014.

Materials and Methods: A descriptive cross sectional survey was carried out on 150 pregnant women by employing systematic sampling. Pregnant women without any serious medical complication were selected for study. Standardized, pretested, domestic violence questionnaire based on PDHS 2012-2013 was used to assess domestic violence during pregnancy. A SPSS version 16.0 was used for data entry and analysis. Descriptive analysis of all categorical variables in form of frequencies and percentages along with binary logistic regression was applied.

Results: Overall, (24.3%) women experienced one form of abuse, answering yes to at least one of the five domestic violence questions.

This study demonstrated the educational level of pregnant women; income, parity, year since married and women empowerment were significantly ($p<0.001$) associated with presence of domestic violence. Parity was a strong predictor of physical abuse ($p<0.001$; OR=2.8, 95%CI=1.3-3.6).

Women who belong to low socio-economic income (<10,000/month) were at significantly high risk ($p<0.001$: OR=1.5, 95%CI=0.9-3.3) of physical abuse as compared to women with middle and high income (20,000-50,00/month).

Conclusion: Prevalence of domestic violence among pregnant women is very high in our part of the world. The statistically significant associated risk factors with the domestic violence are low educational level of pregnant women along with low income, parity, and poor socio-economic status.

Key Words: *Domestic Violence, Risk Factors, Pregnant Women.*

Introduction

Pregnancy is the time when women are making physical, emotional and social preparedness for motherhood, offers no protection from abuse. For some women pregnancy is the result of their partner's violence towards them. Domestic violence is a public health problem worldwide, and associated with adverse consequences of pregnancy outcome.[1] It was found that pregnant women are 60.6% more likely to be beaten than women who are not pregnant. Abuse may be continuous, or it may be a single incident of assault. Abuse may be physical, sexual, psychological/emotional, or economic.[2] During pregnancy, abuse may simply be business as usual, but for some women pregnancy is the trigger of the domestic violence, with male jealousy and anger directed towards unborn baby.[3] A violent pregnancy leads to adverse health consequences such as miscarriages, late prenatal care, still birth, preterm birth, fetal injury, low birth weight, mental health problems such as psychosis, post-traumatic stress disorders, suicide attempts anxiety, stress, chronic pain and gynecological problems.[4]

Compared with those not reporting physical violence, women who did were more likely to deliver by cesarean and be hospitalized before delivery for maternal complications such as kidney infection, premature labor, and trauma due to falls or blows to

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the abdomen.[5-6]Determinants of violence during pregnancy, such as socioeconomic status, maternal age, parity, education of wife, unplanned pregnancy, and consumption of alcohol or drugs, are similar to those outside of pregnancy. Women with unwanted pregnancies had 4.1 times odd of having violence during pregnancy then women did planned pregnancy.[1]

Another study from Nigeria shows prevalence of domestic violence was 28.4%. There was positive relationship between domestic violence during pregnancy; non-supervision of pregnancy and poor attendances to antenatal.[7] A review study indicates that the prevalence of violence during pregnancy ranges from 0.9% to 20.1%.[8]

Known risk factors for violence during pregnancy are maternal age, ethnicity, and low level of education, employment status, parity, smoking, and alcohol and drug abuse. Domestic violence against women is found in the form of physical, emotional, and psychological abuse. Adverse pregnancy outcome associated with violence during pregnancy may result from physical, sexual trauma, indirectly through stress.[9]

A study from Bangladesh found increased education, higher socioeconomic status, non-Muslim religion, and extended family residence to be associated with lower risks of violence. The effects of women's status on violence were found to be highly context-specific.[10]

Intimate partner violence is extremely prevalent and relates to unwanted pregnancy and higher rates of pregnancy loss or termination, particularly miscarriages, among Bangladeshi women. Bangladeshi women experienced violence from husbands were less educated, poorer, and Muslim.[9-11]

A study from Pakistan show quarter of women (23%) reported physical abuse during their recent pregnancy suggesting a serious social and health problem that is particularly challenging for Pakistani obstetricians. Women experienced verbal abuse during their preceding pregnancy, significantly higher than china and Americas.[12] A study conducted in urban community of Hyderabad shows that 51% women of reproductive age experienced physical, verbal abuse before and during pregnancy. Young maternal age, having an unemployed husband and one with other wives/partners, and having had a prior pregnancy were significant predictors of abuse.[13] The few studies have been conducted in Pakistan related to women violence in pregnancy and due to social and cultural problems this issue is not discussed with the health care workers. It is very crucial to have an estimate of violence in women during pregnancy especially in Pakistan as violence not only affects the women but also the whole family can be the sufferer due to this issue. The objective of this study was to estimate prevalence of domestic violence and associated risk factors among pregnant women attending the Federal General Hospital Islamabad.

Materials and Methods

A cross sectional survey was conducted in outpatient department of Federal General Hospital. This study spanned over a period of six months from May 2014 to October 2014.

All married pregnant women who visited Gynea OPD at Federal General Hospital Islamabad were included in this study. The women with comorbidities were excluded from this study. The sample size was calculated by using the single proportion formula with 95% confidence interval and 5% margin of error. For 95% CI the value of Z was 1.96. This sample size was based upon 11% estimated domestic violence cases. (PDHS 2012-13)

Sample size based on estimated domestic violence cases 11%

$$n = z2p(1-p) = 140 + 10\% \text{ refusal} = 150$$

Systematic sampling technique was used to select the study participants. Every 3rd pregnant woman was included in the sample size of the study.

Domestic violence tool which was adopted for study was adopted from PDHS 2012-2013. The questionnaire comprised of twenty seven questions. After taking consent the respondent was taken to a separate place and her privacy and confidentiality was maintained. A total of 150 respondents were interviewed.

A statistical package, SPSS version 16.0 was used for data entry and analysis. Descriptive summary statistics such as mean, frequencies, and percentages were computed for continuous variables. Ten precent 10% of data was randomly checked to look for possible entry errors. Descriptive analysis of all categorical variables in form of frequencies and percentages and summary statistics

for continuous variables was conducted. Binary logistic regression was done to see the association between domestic violence and factors affecting it. Odd ratio was computed at 95% CI to see the significance. The p-values less than 0.05 were considered significant.

Results

Overall, (24.3%) women experienced one form of abuse, answering yes to at least one of the five domestic violence questions. Of these, 13(8.4%) women had experienced physical violence, 3(1.9%) were subjected to sexual coercion during pregnancy, 21 (14.3%) experienced emotional violence (fear of husband).

Table I: Types of Domestic Violence (n=150)

Type of Domestic violence	Yes	No
Physical Violence	13 (8.4%)	137(91.6%)
Emotional Violence	21 (14.3%)	128(85.7%)
Sexual violence	3 (1.9%)	147(98.1%)
Total	24.3%	75.7%

Nine (69%) out of 13 pregnant women experienced physical violence very often, three (23.03%) out of 13 experienced it sometime, and only one (7.69%) out of 13 experienced it in last 6 months during index pregnancy. Rate of emotional (verbal) abuse was slightly higher than physical abuse. Seventeen (80.9%) out of 21 pregnant women were emotionally abused very often during pregnancy. Sexual abuse was relatively less reported during pregnancy.

Different forms of physical and emotional violence was reported during pregnancy. Physical violence was reported as slap or cut 7(53.8%), cut or bruises 4(30.7%) and in form of deep injuries 2(15.3%); while emotional/ verbal abuse was reported as humiliation 5(23.8%), threaten 2(9.52%) and insulted 14(66.6%).

Women who participated in this study were relatively young, with an average age of 24 years. Seventy five (48.7%) pregnant women were between age group (20-25), while 55(35.7%) were between (26-29) years, and 13(8.4%) were fall in age group (30-39). only 7(4.5%) were below 20 years of age.

Results shows that 119 (77%) of them were those who were not educated. only 24(15.6%) pregnant women got primary education; while 7(4.5%) women got secondary education. Education status of their husband was relatively better. About 102 (66.2%) of participant's husbands attended secondary school. Women were mostly housewives 132 (85.7%). Only 12 (7.8%) pregnant women were working. while 6 (3.9%) had other own source of earning. Household income of majority participant 122(79.2%) were in low socio-economic (<10,000/month). Twenty five (16.2%) were those whose household income fall between 10,000-20,000/month. Ninety six (62.3%) women were married from six to ten years; while 39(39.3%) participants were those who were married less than five years and 15(9.7%) were in wed-lock from 11-15 years. More, than half 83(53.9%) women got pregnant 4-5 times, while 38(24.7%) women got pregnant more than five times. only 3(1.9%) women were primygravida. Sixty seven (43.5%) of the participant had (3-4) children, 41(26.6%) had more than five children; while 35(22.7%) women has only 1-2 children. only 7(4.5%) women had no baby at all. One hundred and twenty six (84%) women reported their husband were smoker. While 24(16%) women their husband did not smoke.

In order to see a significant difference in domestic violence and demographic factors chi squire test and binary logistic regression was used.

Women with no education or primary level education were at a significantly higher risk of physical violence, compared to women with secondary level education (p<0.003; OR=3.1, 95%CI= 0.9-4.6). Parity was a strong predictor of physical abuse (p<0.001; OR=2.8, 95%CI=1.3-3.6).

Odds of experiencing violence were approximately double among women who had been pregnant 4-5 time as compare to Primigravida (p<0.00; OR=2.1.95%CI=1.6-2.8). House wives were at significantly high risk of physical violence compared with working women (p<0.00; OR=1.36, 95%CI= 0.62-2.34).

Women who belong to low socio-economic income (<10,000/month) were at significantly high risk (p<0.001:OR=1.5, 95%CI=0.9-3.3) of physical abuse as compared to women with middle and high income (20,000-50,00/month). Women who were married for six to ten years (p<0.013; OR=2.06; 95% CI=0.7-3.1) were at higher risk of being abused than women who were married for less than five. Women whose husband were smoker were at greater risk of being abused as compare to women whose husband were nonsmoker (p<0.00; OR=1.6, 95%CI=0.9-3.1)Table II.

Table II: Risk Factors associated with Domestic violence (n=150)

Variables	Domestic violence			
	Yes n (%)	No n (%)	p-value	OR=95% CI
Age of Mother 15-19Years 20 -25 Years 26-30 Years 31-35 Years 35-39 Years	0 (0.00%) 3 (23.07%) 7 (53.8%) 3 (23.07%) 0 (0.00%)	7 (5.1%) 72 (52.5%) 48(35.03%) 8 (5.8%) 2 (1.45%)	0.001*	 2.3(1.1-4.6) 1.4(0.7-2.9)
Maternal education Illiterate Primary Middle Matric or above	11 (84.6%) 2 (15.3%) 0(0.00%) 0(0.00%)	108 (78.8%) 22 (16.05%) 6(4.37%) 1(0.7%)	0.003*	3.1(0.9-4.6) 2.1(1.0-3.3)
Husband education Illiterate Primary Middle Matric or above	3 (23.07%) 3 (23.07%) 5(38.46%) 2(15.3%)	16 (11.6%) 48 (35.03%) 46(33.5%) 27(19.7%)	0.965	0.8(.2-2.3)
Maternal employment House wife Working lady Others	11 (84.6%) 2 (15.3%) 0(0.00)	121 (88.3%) 10 (7.2%) 6(16.05%)	0.00*	1.36(.62-2.34)
Household income Low Middle High Years since married <5 6-10 11-15	9 (69.2%) 3 (23.07%) 1(7.6%) 10(76.9%) 2 (15.3%) 0 (0.00%)	113 (82.4%) 22 (16.05%) 2 (1.45%) 39 (28.4%) 86 (62.7%) 12 (8.7%)	0.001* 0.013*	1.5(0.9-3.3) 2.06(0.7-3.1)
Number of pregnancies Primigravida 2-3 4-5 >5	1 (7.6%) 0(0.00%) 3(23.07%) 9(69.2%)	2 (1.45%) 26 (18.9%) 80(58.3%) 29(29.1%)	0.00*	 2.1(1.6-2.8)
Number of children No baby 2-3 4-5 >5	0 (0.00%) 0 (0.00%) 5 (38.46%) 8(61.5%)	7 (5.1%) 35 (25.5%) 62 (45.2%) 39(28.4%)	0.001*	 2.8(1.3-3.6)

p-value less than 0.05 was considered statistically significant. The significant values are having * sign.

Discussion

In this research 13% domestic violence was reported that fall within the range quoted from developing countries. The widespread belief that pregnancy either initiates or increases the risk of violence was not substantiated in our study, similar to findings from other studies in developing countries. Our findings lend support to screen for domestic violence during pregnancy.

This research showed various demographic factors such as education, parity, marriage duration, maternal employment, and socioeconomic status were associated with increased risk of domestic violence.[1] Domestic violence during pregnancy should be regarded as risk for postpartum abuse. Women in abusive relationship may suffer from psychological problems.

We found that domestic violence most commonly occur between 20-25 age groups. It was explained in one of the research that the phenomenon of domestic violence among pregnant women as a function of the education, domestic violence is common in illiterate or having just primary education and decline by partner education level, our results shows partner education didn't impact violence during pregnancy(p>.987).9

Violence risks were doubled among women with lower (vs. higher) incomes, women who did not receive financial support from partners or family members.1Violence was associated with socioeconomic and behavioral factors indicative of financial hardship and social instability. Consistent with the results of studies focusing on pregnant women, our bivariate analyses showed that violence was associated with low incomes,a higher income may be less important than financial support from family or partners and a stable housing situation.

The findings indicated that history of violence in childhood was significantly related to physical and verbal abuse. Girls who observed their mother abused by their father were more likely to assume that violence was natural in their own married life.5Domestic violence against pregnant women was common in its various forms. Interestingly, physical abuse during pregnancy was strongly related to previous experiences, and forms, of domestic violence, suggesting that screening for lifetime physical abuse before the onset of pregnancy can be a good predictor of, and a useful tool for prevention programs concerning abuse during pregnancy.

This study confirmed previous conclusions that the vast majority of women do not object to screening

for domestic violence by health professionals. Referral of women to adjunct social services, parenting support groups, and integration of these types of support with prenatal, postpartum, and pediatric care are also critical.

Our study had several methodological limitations, including its cross-sectional design; possible response bias and under-reporting given the sensitivity of the topic, and the inclusion of women from only one antenatal clinic, and the findings may not be generalizable to other pregnant women in Pakistan or elsewhere. For better assessment of domestic violence, longitudinal cohort studies should be performed to identify past-year exposure at baseline and relevant preventive services, including counseling for safety and domestic abuse concerns.

Conclusion

The prevalence of violence is quite high among pregnant women in Islamabad. This result is just a tip of iceberg. The study identified some factors associated with violence against women, which can be used as foci for intervention strategies that are urgently required to prevent the devastating consequences of domestic violence on women's health.

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ORIGINAL ARTICLE

Blood Morphology of Patients Suffering from Malaria

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ABSTRACT

Objective: To find out changes in peripheral blood of patients suffering from malaria.

Study Design: Descriptive case series.

Place and Duration of Study: The study was conducted at Shah Noor Medical Laboratory, Bannu Khyber Pakhtoon khawa from 1st May 2014 to 31st August 2014.

Materials and Methods: In this study 160 cases of malaria patients were selected by non probability random sampling technique with informed consent of the patients. These patients were subjected to complete blood counts performed by Hematology analyzer Sysmex 21 and manual method using Neubaur's chamber and thick and thin films stained with Giemsa stain to confirm malarial parasite. The data was recorded in preformed designed proforma and was analysed by using a Statistical Package for Social Sciences (SPSS) version 16 for percentages, means and standered deviation.

Results: Out of 160 patients 93(58%) were males and 67(41.87%) females. Most 59 (36.8%) were in the age range of 1-10 years. Plasmodium vivax found in 135(84.3%) and Plasmodium falciparum in 25(15.6%) cases. Minimum total leukocyte count (TLC) was 1300/cmm and maximum was 19500/cmm, Low Hemoglobin level was 4.50 g/dl and high value was 15.20 g/dl. Platelets minimum count was 35000/cmm and maximum was 590000/cmm. Anemia was present in 103(64.37%), thrombocytopenia was present in 65 (40.62%), leukopenia was present in 34 (21.25%), bicytopenia was present in 24 (15%) and Pancytopenia was found in 5 (3.12%) of cases, where as high TLC was encountered in 6 (3.75%) cases.

Conclusion: This study shows that person suffering from malaria have significant changes in blood morphology especially cytopenias causing morbidity and mrtality needs special attention regarding accurate diagnosis and prompt treatment to avoid the complications.

Key Words: *Malaria, Plasmodium Vivax, Blood Smear, Thrombocytopenia, Pancytopenia.*

Introduction

Malaria is the most common parasitic disease transmitted by an infected female anopheles mosquito. Malaria transmission occurs in all six WHO regions. Globally an estimated 3.2 billion people are at risk of being infected with malaria and developing disease, and 1.2 billion are at high risk (>1 in 1000 chance of getting malaria in a year).[1]

Four species of Plasmodium can cause human disease, Plasmodium falciparum, vivax, ovale and malariae. The disease is endemic in tropical and subtropical areas of Asia, Africa and North and South America. Worldwide most of the malarial infections are caused by plasmodium vivax, it is the most common infection in Pakistan especially in Khyberpakhtoonkhwa.[2] Pakistan in the group 3 countries of Eastern Mediterraean region (Afghanistan, Djibouti, Sudan, Somalia and Yemen) shares about 95% of the total burden.[3,4]

Malaria if untreated may cause severe morbidity and mortality. Major factors responsible in malaria for morbidity and mortality are anemia and cytopenias. Thrombocytopenia is a well-known complication of malaria and has been present in significant number of malaria patients. The white blood cell count in malaria is usually normal but it may be low or raised in severe cases.[5-8]

Hematological changes in malaria may vary with severity of infection, endemicity of malaria, hemoglobinopathies, nutritional status of patient, demographic factors, and patient immune status. Hematological manifestation of malaria are mainly due to the infection of red blood cells (RBC) by the parasite. The ability of the various plasmodia to infect RBCs is related to their attachment to specific red cell membrane receptors e.g plasmodium vivax and ovale invade only reticulocytes, plasmodium malariae invades only mature RBCs and plasmodium falciparum invades erythrocytes of all ages, as a result the proportion of RBCs parasitized in vivax

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rarely exceeds 1 % and in contrast in falciparum as many as 50% of cells may be infected indicating that various plasmodium species use different receptor.[1,9-14]

The incubation period for plasmodium vivax is usually between 12 and 17 days, but it may be prolonged to 8-9 months or even longer, in plasmodium falciparum and ovale infection this period is from 12 to 18 days and it forms liver hypnozoites and in plasmodium malariae it is 18-40 days; it does not form liver hypnozoites.[15,16] Malaria is diagnosed by microscopic examination of the blood thick and thin films from finger prick after aseptic measures. Two drops of blood are placed on the slide, one for thin smear and other for thick smear. For making good smears practice is mandatory.

Monocytes containing pigment are cleared more slowly than pigment containing neutrophils.[17] Before a thick film smear is judged to be negative, 100 to 200 fields should be examined under oil immersion. Phagocytosed malarial pigment is sometime seen inside peripheral blood monocytes or polymorphonuclear leukocytes and may provide a clue to recent infection if malaria parasites are not detected.[18]

The diagnosis of malaria rests on the demonstration of asexual forms of parasite in the stained peripheral blood smears. After a negative blood smear, repeat smears should be made if there is a high degree of suspicion.[19]

Chinese researchers have shown that smears from intradermal blood may contain more mature forms of plasmodium falciparum than the peripheral blood. This is considered to allow a more complete assessment of severe malaria. The smears are taken from multiple intradermal punctures with a 25 gauge needle on the volar surface of the upper forearm. The puncture should not ooze blood spontaneously, but sero-sanguinous fluid can be expressed on the slide by squeezing.[20]

Changes in Peripheral Blood: Most commonly observed changes in the peripheral blood of malarial patients are thrombocytopenia, anemia and changes in leukocytes.

Anemia: Hemoglobin less than 10.0 g/dl

Thrombocytopenia: Platelet count less than 150,000/cmm

Leukopenia: Total leukocyte count less than 4000/cmm

Leukocytosis: Total leukocyte count more than 11000/cmm

Materials and Methods

This was a descriptive case series study performed in Shah Noor Medical Laboratory at Bannu, KPK. Pakistan. The duration was three months from 1st May, 2014 to 31st August, 2014. The inclusion criteria was all those patients with diagnosed malarial infection on blood smears. Exclusion criteria was malaria patients suffering from known chronic illnesses like tuberculosis or malignancy. In this study 160 cases of malaria patients were selected by non probability random sampling technique with informed consent of the patients. All the malaria positive patients who came to the Shah Noor Medical laboratory for malaria test were selected for this study. Two ml blood was taken using 5 cc disposable syringe, slide both thick and thin were prepared and rest of the blood was placed in EDTA tube for hemoglobin estimation, total leukocyte count and platelets count by both hematology analyzer sysmax KX 21 and were also confirmed manually.

The data of positive malarial cases and laboratory findings of complete blood count investigations were recorded on a proforma specially designed for this purpose.

All the studied variables like age, sex, type of parasite, hemoglobin level, total leukocyte count and platelets count were analyzed for descriptive statistics like percentages, mean and standard deviation as well as male to female ratio was calculated by using a computer program Statistical Package for Social Sciences (SPSS) version 16.

Results

In this study it was found that out of 160 malaria patients 93 (58.2%) were males and 67 (41.8%) were females, with male to female ratio of 1.38:1. Most common age group of in this study was from 1-10 years with the frequency of 59 (36.8%) cases, 39 (24.37%) patients were in the age group of 11-20 years, 27 (16.87%) cases were in the age group of 21-30 years, 19 (11.87%) cases were in the age group of 31-40 years and 16 (10%) cases were in the age group of 41 years and above. Minimum age in this study was 02 year and maximum was 65 years. (Table I).

Amongst the various malarial parasites plasmodium vivax was present in 135 (84.33%) cases and plasmodium falciparum was found in 25 (15.67%) cases, where is no case of plasmodium ovale and malaria were identified. (Table II).

The normal hemoglobin (Hemoglobin level more than 10 gm %) was present in 110(68.75%) of cases. Anemia (Hemoglobin level less than 10 gm %) was present in 50(31.25%) of cases. The lowest hemoglobin level was 4.50 gm% and maximum was 15.20 g%., mean was 11.43 g/%l.

Regarding peripheral blood picture it was found that minimum total leukocyte count (TLC) was 1300/cmm and maximum was 19500/cmm, mean was 7436.25/cmm. Low count was found in 34 (21.25%) of cases and high in 6(3.75%) of cases where is it was normal in 120 (75%) of cases.

The normal platelet count is 150,000 to 450,000/cmm. The lowest platelets count noted was 35,000/cmm, where is highest platelets count was 590,000/cmm. In total of 160 patients 94 (58.75%) patients platelets count was normal, in 64(40.62%) it was low and in 1(o.62%) it was high i.e reactive thrombocytosis was present. Bicytopenia was present in 24 (15%) and pancytopenia was observed in 3(1.87%) cases of malaria patients in this study. (Table III).

Table I: Age group and gender distribution of malarial patients (N=160)

Age group	No of male patients/%age	No of female patients/%age	Combined no./%age
1-10	31(19.37%)	28(17.5%)	59(36.8 %)
11-20	25(15.62%)	14(8.75%)	39(24.37%)
21-30	19(11.87%)	08(5.00%)	27(16.87%)
31-40	10(6.25%)	09(5.62%)	19(11.87%)
>40	8(5.00%)	8(5.00%)	16(10.0%)
Total	93(58.12%)	67(41.87%)	100 %

Table II: Percentage of patients suffering from types of malarial parasites (N=160)

Type of parasite	No of cases	Percentage
Plasmodium vivax	135	84.33%
Plasmodium falciparum	25	15.67%
Total	160	100%

Table III: Common hematological parameters in malarial patients (N=160)

S.no	Parameter	Normal cases (%)	Low cases (%)	High cases (%)
1	Hemoglobin	110(68.75%)	50(31.25%)	00(0%)
2	TLC	120(75%)	34(21.25%)	06(3.75%)
3	Platelets count	94(58.75%)	65(40.62%)	01(0.62%)

Discussion

Malaria is caused by a parasite called Plasmodium which is transmitted via the bites of infected mosquitoes. In the human body, the parasites multiply in the liver, and then infect red blood cells.[1] About 3.4 billion people- half of the world population are at risk of malaria. In 2012 there were about 207 million malaria cases and an estimated 627,000 malaria deaths.[1,21]

In this study malaria was commonly found in children age group (1-10 years) 59(36.8%) followed by age group (21-30 years) and (31-40 years) 39(24.37%) and 27(16.87%) respectively. The same age group in descending order with different percentages were present in a study conducted by Yasinzai et al.[11] In the present study male patients suffered from malaria were 58.2% and females 41.8% with male female ratio of 1.38:1, where is in Atif et al[3],and Idris et al[22] males were 67.35% and 55.17% and females were 32.7%,36.1% and 44.82% respectively. Male predominance is also observed in another study conducted by Yasinzai et al[16], this was 86.2% in males and 13.17% in females. Males are more susceptible to many protozoan infections than females and field and laboratory studies link this increased susceptibility to infection with circulating steroid hormones. Among humans, although the incidence of infection is often similar between the sexes, sex differences in the intensity of infection are reported in which men have higher parasitemia than women (WHO).[1]

In our study of 160 cases of malaria patients, vivax malaria was found in 135(84.33%) cases and falciparum malaria was found in 25(15.67%) of cases. In Idris et al[22] vivax malaria was found in 72.4%, falciparum in 24.1% and in 3.44% mixed infection was found, where is no mixed infection was found in our study. These findings are consistent with other study conducted in Karachi by Mehmood et al[14], while this incidence is quite different in studies conducted in Nawabshah by Akhund et al[15] and in Quetta by Sheikh et al[19] show an increase incidence of plasmodium falciparum 55.55% and 65.82% respectively, and that of plasmodium vivax 44.44% and 34.17% respectively.

Malaria is an annual killer of over one million people globally and its essential co-morbidity is anemia. Anemia due to malaria is a major health problem in

endemic areas particularly for young children and in women of reproductive age (WHO).[1]

In our study anemia (Hemoglobin less than 10 gm/dl) was found in 60 (37.5%) patients. Severe anemia (Hemoglobin <4.5gm/dl) was found in two cases only.

In study conducted by Aatif et al[3] anemia was found in 21.5% of cases. In a study conducted by Jain et al[8] anemia was recorded in 66 (94.28%) patients, in which 37 (56.06%) were plasmodium falciparum, 21 (31.81%) were plasmodium vivax and 8 (12.12%) had mixed plasmodium falciparum and vivax infection. In another study conducted by Abro et al[20] in the Infectious Diseases Unit of Rashid Hospital Dubai anemia was observed in 64% of the patients.

In our study thrombocytopenia (platelet count less than 150,000/cmm) was present in 65 (40.62%) of the cases. In a study conducted by Aatif et al[3] 100% of the patients were having platelets count less than 150,000/cmm, where is 66.61% were having platelets count less than 50,000/cmm. In a study conducted by Mehmood et al[6] at Pakistan field level II Hospital, United Nations Mission in Liberia, it was found that out of 145 diagnosed cases of malaria 109 (75.18%) had thrombocytopenia. In another study conducted by Rajput et al[21] in India 88.88% patients with acute plasmodium vivax malaria were suffering from thrombocytopenia. Thrombocytopenia was also found in 83% of cases in a study conducted Dubai by Abro et al.[20] This present study results are quite different from other studies results regarding thrombocytopenia conducted locally and abroad, the reason may be either low sensitivity of automatic hematology analyzer regarding platelets count as seen in routine practice. Leukopenia was found in 34 (21.25%) of the patients, where is leukocytosis was found in 3.75% of cases. In a study conducted by Aatif et al[3] leukopenia was found in 43.9%, another study conducted in India by Rajput et al[21] leukopenia was observed in 14% and leucocytosis in 4.9% cases. Thus our study in term of leukocyte count is relatively near to these studies.

Conclusion

This study show that person suffering from malaria have significant changes in blood morphology especially cytopenias causing morbidity and mrtality needs special attention regarding accurate diagnosis and prompt treatment to avoid the complications.

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ORIGINAL ARTICLE

Hepatoprotective Effect of Aqueous Extract of Stem Bark of Berberis Lycium Royale in Isoniazid Induced Hepatotoxicity in Mice

Saima Rafiq[1], Adnan Jehangir[2], Samina Iltaf[3]

ABSTRACT

Objective: To determine the hepatoprotective effect of Aqueous extract of Stem Bark of Berberis Lycium Royale in Isoniazid (INH) induced hepatotoxicity in mice.

Study Design: Experimental study.

Place and Duration of Study: The study was conducted from 7th April 2014 till 7th May 2014 at animal house of National Institute of Health, Islamabad.

Materials and Methods: Fifty six male albino Balb/C mice were randomly divided into four groups i.e Group I: Control group (C), Group II: Drug treated group (D), Group III: Low Aqueous group (LA), Group IV: High Aqueous group (HA) of 14 mice each. INH (50 mg/kg) was given to induce hepatotoxicity in all groups except control group (C). Aqueous extract of stem bark of Berberis Lycium Royle was given in low doses (150 mg/kg) to Low Aqueous group (LA) and in high doses (200 mg/kg) to High Aqueous group (HA). Blood samples were collected at day (0, 15th & 30th) for estimation of Liver function tests (LFTs). At the end samples for liver histopathology were taken.

Results: INH produced severe hepatotoxicity as depicted by raised LFT's & severe steatosis, hepatocytic ballooning & inflammation. In animals of Low Aqueous group (LA) and High Aqueous group (HA) , serum levels of biomarkers were decreased and their liver sections showed improved histological picture but the reduction in toxic effects were more pronounced in animals treated with high Aqueous group. (HA).

Conclusion: Aqueous extract of stem bark of Berberis Lycium Royale has more significant hepatoprotective potential in high doses as compare to low doses.

Key words: *Steatosis, Liver Function Tests (LFT's), Hepatoprotective, Isonizaid (INH), Berberis Lycium Royale.*

Introduction

Isoniazid (INH) is among one of the most frequently prescribed first line anti-tuberculosis drug.[1] It causes hepatotoxicity in 12% of treated patients and it is limiting its use in these patients.[2] Drug induced hepatotoxicity (DIH) is mainly caused by three mechanisms i.e direct cell stress, direct mitochondrial impairment, and specific immune reactions.[3] INH induced hepatotoxicity is caused by bioactivation of acetylhydrazine, a metabolite of INH.[4] INH induced hepatotoxicity clinically manifests by raised LFT's and histopathological changes of liver showing steatosis, hepatocytic ballooning and inflammatory changes.[5-7] Previous studies have been done on hepatoprotective effect of aqueous extract of Berberis Lycium Royalein combination with other herbs. No study has been done individually on Berberis Lycium Royale. Our research is designed to evaluate the hepatoprotective effect of aqueous extract of stem bark of Berberis Lycium Royale specifically by measuring LFT's (ALT, AST, ALP & total Bilirubin) and observing histopathological changes of liver. According to medicinal knowledge Berberis Lycium Royle has hepatoprotective properties.[8] Berberis Lycium Royle is known as Barberry in English, Kashmal in Hindi, Sumbloo in Urdu, Ziarlargay in Pushto.[9] Stem and the stem bark contain an important component Berberine in a proportion of 4.2%[10] and is known to have the hypoglycemic potential.[11] They are used for the cure of jaundice, rheumatism and eye infections. The stem bark is very efficacious in the treatment of ear injury, headache and whooping cough[12] Berberis Lycium Royle is found to have hepatoprotective effect.[13]

The purpose of present study was to explore the hepatoprotective effects of aqueous extract of stem bark of Berberis Lycium Royle individually on INH

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induced hepatotoxicity in mice model.

Materials and Methods

An explorative animal study was carried out in animal house of National Institute of Health (NIH), Islamabad from 7th April 2014 till 7th may 2014. A total of fifty six healthy male albino Balb/C mice, weighing 28-38g and aged between 6-8 weeks, having normal LFT's were included in study. All mice were acclimatized for one week. Then they were randomly divided in four groups (group I-IV), each group containing 14 mice (n=14). Group I (n=14) served as the normal control group (C) given normal diet and fresh water orally. Group II was Drug treated group (D) given INH (50mg/kg body wt)[14] Group III was Low dose Aqueous extract (LA) group received low dose (150 mg/Kg body wt) & Group IV was High dose Aqueous extract (HA) group given high dose (200 mg/Kg body wt) of aqueous extract of stem bark of Berberis Lycium Royle along with INH (50 mg/kg body wt). The herb and the drugs were given orally for four consecutive weeks. Mice were housed under controlled conditions of room temperature 20 ± 2 0C, relative humidity 50% - 70% and 12-h light-dark cycle. They were provided free access to water ad libitum. All mice received the care in accordance with the NIH guidelines.

The stem bark of Berberis Lycium Royle was collected from village Prang, Charsadda. It was identified by a botanist Ghulam Jillani at Herbarium section of Botany department, Peshawar University. It was then washed with water thoroughly and shade dried. It was grounded into a fine powder with the help of an electrical grinder and taken into a non-metallic jar. The bark powder was soaked in distilled water for 72 hours with periodic stirring. It was then filtered using Whatmann filter paper no 1. The filtrate was evaporated at 55 0C in a rotary evaporator at the research laboratory of Riphah Institute of Pharmaceutical Sciences (RIPS), Islamabad. The extract was obtained as a dark brown semi-solid sticky paste. It was stored in air tight glass bottles, protected from light and kept in refrigerator at 2-8 oC to be used throughout the experiment. The yield of aqueous extract of stem bark of Berberis lycium Royle with respect to the original dry plant material was about 25%.[15] Blood samples of 2 mice from each group were collected at day 0 for baseline LFT's & at day 15th for evaluation of progress of research. Finally blood samples of 10 mice from each group were taken at day 30th for final evaluation of LFT's. Blood samples of 2 ml were collected in sterile vacuotainer with gel by performing cardiac puncture. All blood samples were allowed to clot and serum was separated from the clotted blood samples by centrifugation at 3000 rpm for 10min, using bench top centrifuge machine. All of the serum samples were stored in serum cups at -20°C until used for biochemical evaluation.[16]ALT, AST & ALP were estimated by commercially available kits (Merck pharma) & total bilirubin by (Spectrum Diagnostics kit). Serum ALT, AST, was estimated by IFCC, ALP by Optimised standard method[17]& total bilirubin by Calorimetric method.[18] At the end of experiment liver samples were removed and preserved in 10% formalin after anesthetizing mice. Slides were prepared and stained by using haematoxylin and eosin (H & E stain). Microscopic study of slides was done under 40X objective for steatosis, heaptocytic ballooning and inflammatory infiltrates. Descriptive statistics were applied using one way ANOVA test on SPSS 20. The level ofsignificance was pre-defined as <0.05 ($p<0.05$).

Results

Effect of Berberis lycium Royale on serum Alanineaminotransferase (ALT) levels

Isoniazid caused significantly increased level of serum ALT (183.1 ± 63.32) in mice of drug treated group (D) as compared to control group C (53 ± 4.99), but these levels were further reduced in mice of (LA) group (78.90 ± 3.85) and more significantly reduced in (HA) group (58.3 ± 3.93) treated with Berberis Lycium Royale.(Table I)

Effect of Berberis Lycium Royaleon serum Aspartate aminotransferase (AST)levels

Results showed that level of serum AST was significantly increased ($p<0.001$) in mice of drug treated group (D) given INH as compared to control group (C) , but these levels were greatly reduced in mice of (LA) group and more significantly reduced in (HA) group treated with Berberis Lycium Royale.

Effect of Berberis Lycium Royale on serum Alkaline phosphatase (ALP) levels

Serum ALP level was significantly increased ($p<0.001$) in mice of Drug treated group (D) given INH as compared to control group (C). ALP levels were reduced in (LA) group with significant reduction in

(HA) group treated with Berberis Lycium Royale.
Effect of Berberis Lycium Royale on serum total bilirubin levels. Similar results were observed for serum total bilirubin levels showing slight reduction in (LA) group followed by significant reduction (p< 0.001) in (HA) group both treated with Berberis Lycium Royale.

Table I:Comparison Of Liver Function Tests (LFT's) in different Groups

Animal Group No. (n=10)	T.Bil (mg/dl) (0-0.9 mg/dl)	ALT (U/L) (17-77 U/L)	AST(U/L) (54-298 U/L)	ALP(U/L) (35-96 U/L)
Group I (C)	0.10 ± 0.0	53 ± 4.99	107.1 ± 18.46	88.6 ± 1.24
Group II (D)	1.26 ± 0.069	183.1 ± 63.32	428.9 ± 55.32	173.6 ± 28.89
Group III (LA)	0.50 ± 0.226	78.90 ± 3.85	263.5 ± 28.72	99.1 ± 3.93
Group IV (HA)	0.19 ± 0.137	58.3 ± 3.93	117.9 ± 16.97	87.8 ± 1.66
p-value	< 0.001*	< 0.001*	< 0.001*	< 0.001*

*= p – value Significant
(ALT= Alanine aminotransferase,
AST= Aspartate aminotransferase,
ALP =AlkalinePhosphatase, T. Bil=Total Bilirubin)

Table II: Post-hoc comparison of Total bilirubin & ALT between the groups

Group Comparisons	Total Bilirubin		ALT	
	Mean difference	p-value	Mean difference	p-value
Group C vs. Group D	- 1.16	< 0.001*	- 130.1	< 0.001*
Group C vs. Group LA	- 0.40	< 0.001*	- 25.9	0.522
Group C vs. Group HA	- 0.09	0.855	- 5.30	0.999
Group D vs. Group LA	0.76	< 0.001*	104.2	< 0.001*
Group D vs. Group HA	1.07	< 0.001*	124.8	< 0.001*
Group LA vs. Group HA	0.31	0.003*	20.6	0.744

Table III: Post-hoc comparison of AST & ALP between the groups

Group Comparisons	AST		ALP	
	Mean difference	p-value	Mean difference	p-value
Group C vs. Group D	- 321.8	< 0.001*	- 85.0	< 0.001*
Group C vs. Group LA	- 156.4	0.008*	- 10.5	0.993
Group C vs. Group HA	- 10.8	1.000	0.8	1.000
Group D vs. Group LA	165.4	0.004*	74.5	0.002*
Group D vs. Group HA	336.7	< 0.001*	85.8	< 0.001*
Group LA vs.Group HA	171.3	0.003*	11.3	0.990

*= p – value Significant
(ALT= Alanine aminotransferase,
AST= Aspartate aminotransferase,
ALP=AlkalinePhosphatase,
T. Bil=Total Bilirubin)

Histopathological Examination

Histological examination of H & E preparations of liver specimen of control group (C) showed normal gross appearance i.e. reddish brown color of liver having smooth surfaces, microscopically normal lobular appearance having normal central vein, portal tract and radiating cords of heptocytes (Fig 1).

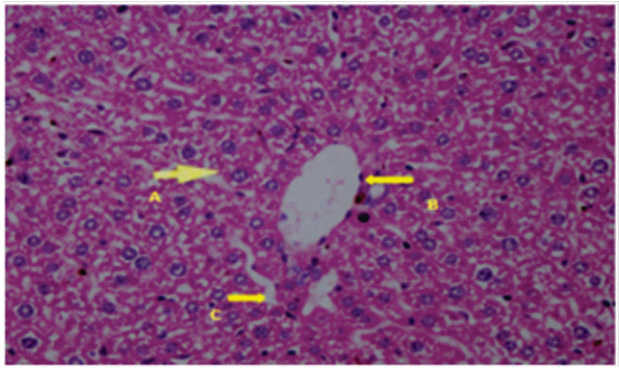

Fig 1: Photomicrograph of the section of Liver of an animal no. 1 of control group C showing [Hepatocyte (A), Central vein (B), Sinusoid space (C)]. H & E Stain, 40 X

Drug treated group (D) mice who were given INH, showed moderate to severe liver damage characterized by severe steatosis, marked hepatocytic ballooning and heavy inflammatory infiltrates (Fig 2).

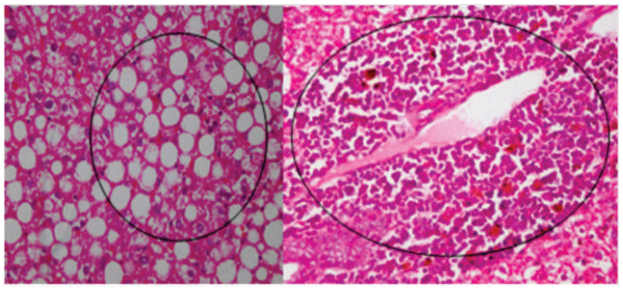

Fig 2: Photomicrograph of section of liver specimen of Drug treated group showing severe steatosis and perivenular inflammatory infiltrate. H & E Stain, 40X

Histological examination of H & E preparations of liver specimen of aqueous extract treated group revealed reversal to mild perivenular inflammation, mild portal inflammation, mild intralobular inflammation, mild steatosis and few ballooned cells in low dose (150mg/Kg) and minimal inflammation, minimal steatosis, minimal hepatocytic ballooning in high doses treated group(200 mg/Kg) (Fig 3).

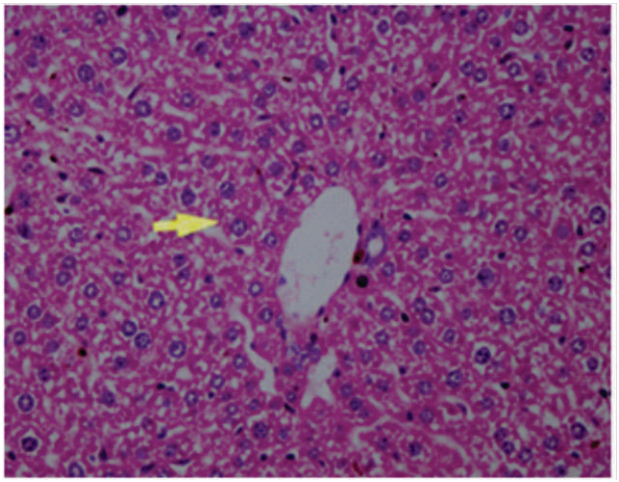

Fig 3: Photomicrograph of section of liver specimen of aqueous extract treated group showing minimal inflammtion, minimal steatosis and minimal hepatocytic ballooning

Discussion

Hepatotoxicity is a common side effect when treating TB patients during anti-tuberculosis treatment.[19] Hepatotoxicity due to anti-tubercular drugs is found to be mediated through oxidative stress and free radical damage to hepatocytes.[20] It is documented that in sub-acute and chronic inflammation, reactive oxygen species (ROS) play a major role in modulating the degree of inflammatory response and subsequent tissue and cell injury. Antioxidants are well considered as probable protective agents in decreasing the oxidative damage of human body from ROS and impede the progress of many diseases.[7]

Berberis Lycium is found as a best source of free radical scavenging compounds.[21] Our study was designed to explore the hepatoprotective effect of aqueous extract of Berberis Lycium Royale. Our study results showed that aqueous extract of stem bark of Berberis Lycium Royle has significant hepatoprotective activity ($p < 0.001$) in dose-dependent manner. High dose of extract (200mg/kg body wt) lowered ALT, AST, ALP and total bilirubin (LFTs) level to a greater extent as compared to low dose (150mg/kg body wt). Significant elevation was noticed in levels of serum ALP, AST, ALT, and total bilirubin in group D which were given combination of isoniazid and rifampicin as compared to group C mice which received no medications. Increased levels of (LFTs) are markers of hepatotoxicity. Combined administration of high dose (200mg/kg) Berberis Lycium Royle aqueous extract with isoniazid and rifampicin in high aqueous (HA) group, restored ALP, AST, ALT, serum total bilirubin towards normal level as compared to drug treated group (D). It was most probably due to anti-oxidant effect of Berberis Lycium Royle. Our research results are in accordance with study carried by Khan & his colleagues in 2011 which showed hepatoprotective activity of aqueous extract of Berberis Lycium Royale in combination with Gallium aparine & Pistacia Integerrima in Ccl4 treated rabbits.[15]Our research results are also found in correlation with another study showing hepatoprotective effect of Berberis Lycium in six poly herbal formulations including Livokin (Herbo-med, Kolkata) in paracetamol induced hepatotoxic mice model[22] Studies have been done on combination of Berberis Lycium Royale with other herbs regarding hepatoprotective activity. No study has been done individually on aqueous extract of stem bark of Berberis Lycium Royale regarding hepatoprotective activity. Our research results proved the hepatoprotective effect of aqueous extract of stem bark of Berberis Lycium Royale individually.

No histopathological studies of liver specimens have been done to explore the hepatoprotective role of Berberis Lycium Royle. In our study there was greasy appearance and yellow discoloration of liver specimens in drug treated group (D) given isoniazid. Similar observations were recorded by Imber in 2002 while doing research on hepatic steatosis and its relationship to liver transplantation.[23] Steatosis is the most important histological feature of drug induced liver injury (DILI). In our research moderate to severe steatosis was observed in most of the mice of drug treated group (D) (Figure 22). Similar results were also observed by Hassan in 2012 while inducing hepatotoxicity in rabbit by using isoniazid.[5] Mice treated with Berberis Lycium Royle showed reverse steatotic changes produced by isoniazid giving evidence of hepatoprotective potential in experimental groups which received extracts of Berberis Lycium Royle. Hepatocytic ballooning is the important marker to distinguish steatohepatitis from simple steatosis. It is the most important characteristic feature of steatohepatitis.[24]

In our study there was prominent ballooning in many heptocytes of drug treated group (D) which received isoniazid. Our study results correlate with the

research done by Maryam in 2010 who induced hepatotoxicity in rabbits by isoniazid.[6] Similar results were also found by Hassan in 2012 while doing research on the effect of Nigella sativa (Black seeds) in isoniazid (INH)-induced hepatotoxicity in rabbits.[5]

Our study results showed that aqueous extract of Berberis Lycium Royale significantly reversed hepatocytic ballooning with best reversal in high dose aqueous extract treated group as compare to low dose aqueous extract treated group.

Severe inflammation was observed in drug treated group (D) given isoniazid. Drug treated group (D) showed severe inflammation. Our results are in accordance with the study done by Hassan in 2012 while inducing hepatotoxicity in rabbit by using isoniazid.[5]

Our research results indicate that aqueous extract of Berberis Lycium Royale significantly reverse inflammatory changes ($p<0.001$) with more best reversal obtained with high dose (200 mg/Kg body wt) aqueous group (H A).

Histopathological changes induced by isoniazid were improved after giving aqueous extract of Berberis Lycium Royle. Hepatoprotective activity may be due to presence of antioxidant properties of flavonoids present in the Berberis Lycium Royle.[25] No study has been done to find the hepatoprotective effect of aqueous extract of Berberis Lycium Royle individually. Our research results proved the hepatoprotective effect of aqueous extracts of stem bark of Berberis Lycium Royle.

Conclusion

Aqueous extract of stem bark of Berberis Lycium Royle has significant hepatoprotective potential in isoniazid induced hepatotoxicity in male mice model in a dose dependent manner.

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ORIGINAL ARTICLE

Efficacy of Cervical Spine Mobilization Versus Peripheral Nerve Slider Techniques (Neurodynamics) in Cervicobrachial Pain Syndrome

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ABSTRACT

Objective: The objective of this study was to compare the efficacy of cervical spine mobilization versus peripheral nerve slider techniques (neurodynamics) incervicobrachial pain syndrome.

Study Design: The study design was arandomized interventional study.

Place and Duration of Study: This study was conducted at the Armed Forces Institute of Rehabilitation Sciences (AFIRM), Rawalpindi from August 2014 to January 2015.

Materials and Methods: Forty patients (n=40) were included by using purposive sampling technique. Patients of Age 30 to 60 years with Radiating neck pain, Limited ROM of neck and Pain persisting for more than 2 months, were included in study. Then randomly divided into two groups, each group contains 20 participants. One group was treated with neck mobilization and other was treated with neurodynamic treatment protocol. Pain and Active Range of Motion (AROM) was measured by Visual analog scale (VAS) and Inclinometer respectively. Neck Disability Index was also used. Patients were assessed before and after six week intervention. Data was analyzed on SPSS 20 and Independent t Test was used to compare the results of two groups.

Results: Pain was measured on VAS, the mean of Mobilization and Neurodynamics were (2.0+1.892 vs. 4.8+2.397) respectively. There is significant ($p<0.05$) difference between two groups. There is also significant ($p<0.05$)difference for Range of Motion between two groups. The mean value for NDI of both groups were (14.5+7.564 vs 26.80+11.484). It also shows better treatment is mobilization.

Conclusion: The results of this comparison between two single interventions indicate that cervical mobilization treatment in neck pain is more useful than anneurodynamic treatment. For daily practice, we can recommend treatment according to the expert guidelines investigated.

Key Words: *Neurodynamic, Neck Mobilization, NDI, VAS.*

Introduction

Neck pain is the major health complains in our society and also worldwide. When there is a combination of neck pain and complaint in the arm, we can call it a cervicobrachial syndrome or cervicobrachialgia. It refers to a cervical syndrome with pain radiating into the upper limb. Cervicobrachial syndrome was, therefore, previously known as “lower cervical syndrome”. Life time prevelance of cervicobrachialgia is 71%.[1]

Cervicobrachialgiais one of those condition which has huge financial and disabling impact on population.[1] In cervicobrachialgia the cervical canal may be narrowed by osteophyticlipping of the facet or uncovertebral joints, by central disc herniations, by thickening of the ligamentumflavem, or even from local cervical vertebral subluxations associated with ligamentous laxity.[2]

Vertebral artery involvement by osteophytic outgrowths or local spinal instability may cause drop attacks precipitated by extension of the neck. Osteophytes arising from the anterior vertebral margins may sometimes, because of their size, give rise to dysphagia[3] Neck pain is a common disorder in our population, and combined with low back pain. A number of studies show moderate to good evidence that manual therapy may all eviate neck pain. This an algesicef fect may not only bee xplained by traditional approaches such as the Gate Control. The oryand reduce peripheral afferent discharge but also by the activation of central nervous pain mechanisms such as the peri aqueductal gray, which seems to be responsible for modulation of auto

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nomic functions and pain control. There was greater improvement in function and pain with manual therapy (manipulation/mobilization) directly on the cervical spine and indirectly on the shoulder and dorsal spine than without treatment.[4]

Neuromobilization maneuver has recently been used to treat nerve entrapment syndromes. It consists of a series of therapeutic active and passive movements aimed at restoring the normal mechanical properties of the nerve in common postures and during extremity movements. Neuromobilization maneuvers help to restore longitudinal motion of the affected nerve. Any pathology that reduces the nerve motion and normalstrain may produce an abnormal tension in the corresponding nerve in common postures and during extremity movements.[5]

As nerve mobilization only improve the mobility of nerve within different interfaces.[4] If the compression will be on these interfaces then it will be relive by neurodynamics. On the other hand cervical mobilization also decreases pressure on nerve roots. Individually these therapeutics techniques are effective for cervicobrachialgia but with certain limitations. So the objective of this study was to compare the effects of neudynamics and cervical mobilization on cervicobrachial pain.

Materials and Methods

The study design was randomized interventional study, conducted at the AFIRM Rawalpindi, from August 2014 to January 2015. The study protocol was duly approved from ethical committees of AFIRM. Total sample size was 40 patients. Patients of Age 30 to 60 years with Radiating neck pain, Limited ROM of neck and Pain persisting for more than 2 months, were included in study. But Patients with spinal stenosis, Disc bulge, Spinal surgery, Carcinoma and Neuromuscular Pathology were excluded from study. We divided patients in both groups by lottery draw method. In mobilization group treatment was given by fallowing the Maitland Treatment Guidelines and control group was treated with standard protocol of neurodynamics.

Data collection variables were structured Questionnaire, VAS, Range of Motion (ROM), NDI, and Neck Bournemouth Questionnaire. This was quantitative, parametric data. It was entered on SPSS 20 software and Independent t Test was applied to compare the results of two groups.

Results

All participants (n=40) of this study were divided into Mobilization (n=20) and Neurodynamic groups (n=20). The mean age of Mobilization group was 52.60+6.159 and Neurodynamic group was 42.70 + 9.953. There is significant difference ($p<0.05$) for neck disability index between mobilization (14.50+ 7.564) and neurodynamics (26.80 + 11.484) group (Fig 1). Mean + SD of all neck ranges (degrees) Flexion, extension, side bending to painful and non painful side, rotations of both sides of Neck in both Group was measured (Table I). There is significant difference ($p<0.05$) between both group. There is also significant difference ($p<0.05$) for visual Analogue Scale between mobilization (2.0+ 1.892) and neurodynamics (4.8 + 2.397) group (TableII).

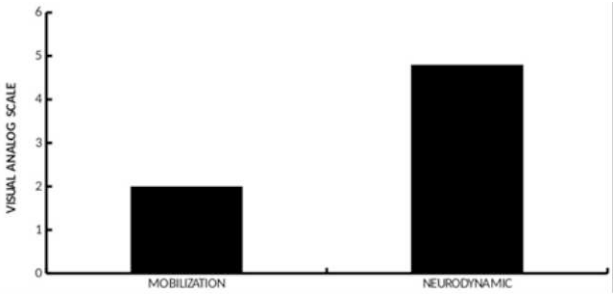

Fig 1: Mean of Visual Analogue Scale in Mobilization and Neurodynamic Group. There is significant difference ($p<0.05$) between both groups

Table I: Mean and Standard Deviation of Flexion, Extension, Side Bending Painful side, Side Bending Non-Painful side, Rotation Painful side, Rotation Non-Painful side

Variables	Mobilization Mean ± SD	Nuerodynamics Mean ± SD	P-Value
Flexion of neck	71.50±4.323	63.00±7.504	0.000***
Extension of neck	43.75±2.221	39.75±4.128	0.000***
Side bending pain full side	39.25±2.447	34.50±4.261	0.000***
Side bending non pain full side	38.25±4.375	35.0±4.292	0.023*
Rotation pain full side	37.00±6.959	36.0±6.407	0.639
Rotation non pain full side	33.25±7.482	32.75±6.382	0.821
Visual analog scale	2.0±1.892	4.8±2.397	0.000***
Neck disability index (NDI)	14.50±7.564	26.80±11.484	0.000***

Table II: Mean and Standard Deviation of Visual Analog Scale (VAS), NDI, Rate Neck Pain, Neck Pain Interfared activity (ADL), Neck Pain Interfered Social Activity, Neck Pain & Anxiousness, Neck Pain & Depression, Neck Pain Affected on Job, Self Control on Neck Pain

Variables	Mobilization Mean ± SD	Nuerodynamics Mean ± SD	P-Value
Visual analog scale	2.0±1.892	4.8±2.397	0.000***
Neck disability index (NDI)	14.50±7.564	26.80±11.484	0.000***
Rate neck pain	1.55±1.504	4.70±2.364	0.000***
Neck pain interfered your activity	1.65±1.872	4.10±2.882	0.003**
Neck pain interfered your social activity	1.70±1.658	4.40±2.664	0.000***
How anxious your feeing	1.65±1.599	4.05±2.523	0.001**
How depressed	1.50±1.573	4.30±2.577	0.000**
How your work affected	1.40±1.729	3.90±2.808	0.002**
How much able to control your neck pain	1.10±1.518	3.75±2.468	0.000***

Discussion

The results revealed significant pain reduction in the neck pain for the patients who received cervical mobilization. Over the investigation period, these patients showed a decreases in neck pain on the Visual Analogue Scale which can be regarded as a clinically relevant change.[7]

To date, the only known study to compare articular with neurodynamic treatment was conducted by Allison et al.[8] Thirty patients with cervicobrachial pain were randomly assigned to one of three groups: neural treatment, articular treatment, and control group. Neural treatment involved mobilization techniques for neural and adjacent tissues, such as cervical lateral glide, shoulder girdle oscillation and muscle re-education. The articular treatment consisted of indirect approaches such as glenohumeral mobilization and thoracic mobilization. No treatment was performed in the third group. Pain was assessed at baseline and after four and eight weeks. The result showed significant pain reduction in both group. Furthermore the between group comparison revealed a significant difference after eight weeks with the patients in the neural treatment groups reporting lower pain on the VAS than those receiving the articular treatment. The authors concluded that both interventions could significantly reduce pain with a potential advantage for the specific neural treatment but mentioned that the articular treatment is a generalized treatment not addressed to actual joint dysfunction. Therefore the effects of the articular treatment approach can be regarded as indirectly supporting the hypothesis that less direct techniques could also affect neural structures. Although comparing a neural with an articular treatment approach, these findings may not be compared to the results in the present study. While Allison et al[8] performed neurodynamic techniques in combination with articular mobilization techniques, for example the cervical lateral glide, which is thought to influence the neural as well as the articular tissues[9], within one group, these techniques were explicitly separated in the present study.

The analgesic effect of cervical mobilization techniques is supported by other investigations.[10,11,12,13] Schmid et al[12] and Bialsky et al[14] suggested that supraspinal centers are likely to be important in pain modulation. Furthermore, they hypothesized that the periaqueductal grey (PAG) in the midbrain may be involved. An analgesic effect through the likely activation of this supraspinal center may explain the pain reduction in regions not directly addressed by the treatment. In the present study this effect can be seen in the patients who received neurodynamic treatment and experienced decreased neck pain. In the patients who received cervical mobilization, the analgesic effects in the neck and arm may either be explained by the above mentioned supraspinal centers or by an improved functioning of the mechanical interfaces.

Due to the mobilization, the facet joints are supposed to have a better opening and closing function, thereby reducing compression on neural tissues. This reduced compression might contribute to improve physiological and mechanical conditions in the neural tissues, leading to analgesic effects in the upper extremity.[15]

Regarding cervical range of motion, the patients in experimental group gradually improved more than the patients in control group. A possible reason for this might be that the patients in experimental group received mobilization techniques directly applied at the cervical spine. These techniques are not only effective for pain reduction but also for increasing range of motion[15], where as the primary objective

of neurodynamic techniques is not an increase in cervical range of motion but pain reduction as well as an increase in neural mobility.[14,15]

For these reasons, a greater improvement in the cervical range of motion through the mobilization treatment was expected. Although to a lesser extent, the neurodynamic treatment also led to increases in cervical range of motion. This may be explained by the improved gliding and sliding of neural tissues leading to reduced interference of the cervical motions.[15]

Conclusion

The results of this comparison between two single interventions indicate that cervical mobilization treatment in neck pain is more useful than neurodynamic treatment. For daily practice, we can recommend treatment according to the expert guidelines investigated. However, further research is needed to provide stronger scientific evidence. There is greater improvement in function and pain with manual therapy (mobilization) directly on the cervical spine and indirectly on the shoulder and dorsal spine than without treatment.

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ORIGINAL ARTICLE

General Population's Awareness of Commercially Available Dental Products

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ABSTRACT

Objective: The aim of this survey was to assess the knowledge of general population regarding commercially available dental products.

Study Design: Cross-sectional survey.

Place and Duration of Study: Three different undergraduate institutes of Islamabad from April to June 2014.

Materials and Methods: A self-administered questionnaire was distributed and filled by 70 participants of ages 15-30 years. The sample of students was selected from three undergraduate institutes of Islamabad.

Results: In Section A, about 20 (28.6 %) participants were using only toothpaste to maintain their oral hygiene. One (1.4%) participant was using only dental floss. About 48 (68.6%) people were using fluoridated toothpaste. About 44 (62.9%) participants were using medium bristle toothbrush. In Section B, 19 (27.1%) participants were using teeth whitening agents, out of which 17 (24.3%) participants were using toothpaste to whiten their teeth. Fifteen (21.43%) participants got their required results. Sixteen (22.87%) participants found no side effects after using it. In section C, 27 (38.57%) and 54 (77.114%) participants only went to dentist when they had the toothache and gingivitis respectively. Forty-five (64.29%) participants completed their antibiotic course. Twenty-one (30%) participants thought that it was alright to use medicated products without consulting doctor.

Conclusion: Most of the people are using fluoridated toothpaste and medium bristle toothbrush. Many people use over the counter teeth whitening agents. And many people use over the counter antibiotics for dental problems and they think it is alright if they do not complete antibiotic course.

Keys Words: *Dental Products, Self Medication, Oral Hygiene.*

Introduction

Although diseases of the oral health were considered to be different from the general health, efforts have been made to recognize oral health as an essential part of general health.[1]

This change in the global view on health has been based on the premise that if the oral health is compromised all aspects of health are disturbed.[2] So it is very important to have correct knowledge about the dental products and dental aids and to use them in a correct way. Commercially available dental products include normal to medicated toothpaste, mouthwash, dental floss and tooth powder. It also includes the teeth whitening agents and drugs used for dental treatment. Over the counter products are those drugs which are sold without the prescription of a health care professional.[3] Prescription drugs are the drugs which are sold to a consumer having a valid prescription.[4] In Pakistan, many dental products and drugs are available in medical stores and super markets. Medicated products are used by individuals, without consultation of a health professional.[5] Chang and Trivedi have described the phenomenon seen in developing countries that every pharmacy sells drugs without proper prescription.[6] Pilgrim et al. investigated there were 137 deaths in Victoria, Australia from 2001 to 2005 due to methadone, an opioid analgesic, toxicity which was taken as a pain killer.[7] Although adolescents have been reported to the basic knowledge regarding dental health such as importance of tooth brushing they still fail to brush their teeth routinely.[8] A few studies investigating the knowledge of the general population regarding oral health have been conducted in developing countries.[9,10] An association relating oral health and socioeconomic status has been suggested in literature.[11] Moreover a study has been reported in Pakistan, according to which use of un-prescribed analgesics to very high despite the fact that many people are aware of the harmful effects of it.[5] Hence

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the purpose of our study was to assess the knowledge of general population about the use of commercially available dental products.

The aim of the survey was to assess the existing knowledge of the general population regarding commercially available dental products. This survey was set out to identify areas where the knowledge of people is lacking so that health education campaigns may be planned in those areas.

Materials and Methods

A cross sectional survey was conducted in three institutes of Islamabad which included Islamic International Dental College, Comsats University and Nust IESC from April to June 2014. Male and female participants of age 15-30 years were included. There were 70 participants selected by convenient sampling from three institutes of Islamabad. A self administered questionnaire was filled by the participants. The quantitative data was analyzed using PASW statistics 17.0. Descriptive statistics were calculated for the questions responses.

The questionnaire was checked for face and content validity by distributing the questionnaire among three dental specialists. The specialists were requested to analyze the questionnaire for the content, wording and context of the questionnaire. Modifications were made in the questionnaire in light of the suggested changes by the dental specialists.

Results

Seventy people were included in the survey. All 70 participants completed the questionnaires and there was no loss to follow up. In the final results, data for all the 70 participants (18 males and 52 females) is included. Twenty-one (30%) out of 70 participants reported using only toothpaste to maintain their oral hygiene. Twenty-five (35.7%) participants were using both toothpaste and mouthwash. Seven (10%) participants used both toothpaste and miswak. Eight (11.4%) participants used both toothpaste and floss. Three (4.3%) participants used toothpaste, mouthwash and floss. Four(5.7%) participants used toothpaste, mouthwash, toothpowder and toothpaste. One (1.4%) participants used toothpowder, mouthwash and miswak. One person (1.4%) was using toothpaste and tooth powder to maintain his oral hygiene.

All the 70 participants were using toothbrush to maintain their oral hygiene. Seventeen (24.3%) out of 70 participants were using toothbrush once a day. Fifty two (74.3%) out of 70 participants were using toothpaste twice a day and one (1.4%) participant was using it more than twice a day.

Thirty three (42.8%) out of 70 participants were using mouthwash along with toothbrush to maintain their oral hygiene. Sixteen (22.8%) out of 70 participants were using mouthwash once a day. Six (51.4%) participants were using mouthwash twice a day, two (2.9%) participants were using mouthwash thrice a day, five (7.1%) participants were using mouthwash weekly, two (2.9%) participants were using mouthwash monthly and two (2.9%) participants were using mouthwash sometimes along with toothpaste to maintain their oral hygiene.

Two (2.9%) out of 70 participants were using tooth powder. Two (2.9%) participants used dental floss once a day. Three (4.3%) participantswere using it

Table I: Frequency of use of teeth whitening products

	What do you use to whiten your teeth?			
	Teeth whitening agents		Teeth whitening strips	
	17		01	
Did you achieve your required results?	Yes	14	Yes	01
	No	03		
From where did you get to know about the products?	advertisement	12	Family & friend	01
	Dentist	04		
	Family & friend	01		
Did you find any side effect?	None	16	None	01
	Increase in sensitivity	01		

Total 18 people out of 70 used teeth whitening agents.

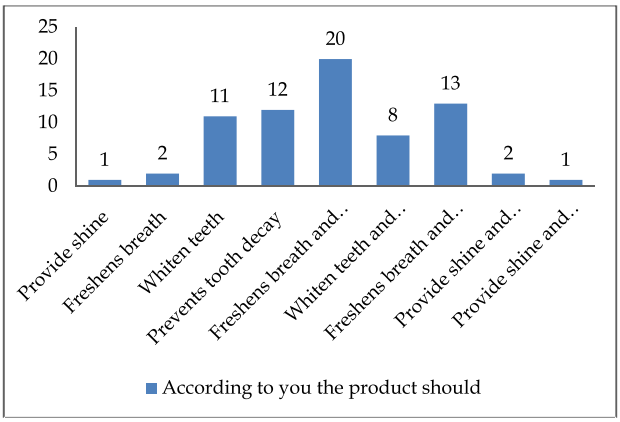

Fig 1: Frequency of Reasons for using Teeth Whitening Products

once a week. Four (5.7%) participants used it rarely.
Forty five (64.3%) out of 70 participants were using medium bristle toothbrush to maintain their oral hygiene. Twenty three (32.8%) participants were using soft bristles and two (2.9%) participants were using hard bristle toothbrush to maintain their oral hygiene.
Fifty two (74.3%) out of 70 participants said that they chose the brand of toothpaste because it is more effective. Ten (14.3%) participants chose the brand because it is easily available, one participant (1.4%) chose the brand because it is cheaper, seven (10%) participants chose the brand because of other reasons.

Table II: Frequency of use of Over the Counter Drugs

		Frequency	Percent
What do you do when you have toothache?	Go to dentist Take homemade remedy Take analgesics Do nothing TOTAL	27 14 23 06 70	38.6 20.0 32.9 08.6 100
What do you do when you have gum infection?	Go to dentist Self medication Use home remedies TOTAL	54 13 03 70	77.1 18.6 04.3 100
Do you complete your antibiotic course?	Yes No TOTAL	45 25 70	64.3 35.7 100
Using medicated products without consulting doctor	Yes No TOTAL	21 49 70	30.0 70.0 100

Table III: Demographic detail

No of participants	Age group	Highest qualification	Total
Male = 18	15-30	Upto FSc	05
		Bachelors	10
		Upto Masters	03
Female = 52	15-30	Upto FSc	01
		Bachelors	49
		Upto Masters	02

Discussion

Generally participants are aware of importance of the basic dental products however some areas need work. All the participantsare using toothpaste to maintain their oral hygiene. Fifty two out of 70 participants brush twice a day and 45 out of 70 participants are using a medium bristle toothbrush. Most participants are also using mouthwash once a day to maintain their oral health. This shows that most of the people have the basic knowledge regarding the use of tooth brush. As reported in research conducted in India that mostly adults have the knowledge about oral health like use of toothbrush but still they fail to maintain their oral hygiene because they underestimate their oral health risks.[8] The percentages of dental floss and miswak users is very low which shows that people are not so aware of the use and importance of dental floss. As this study is done in few colleges of Islamabad where the literacy rate is high and socioeconomic status is high we can state that education and socioeconomic status are factors determining their use of fluoridated tooth pastes. Socioeconomic status is a determinant of overall health and it has a role in the practical implication of knowledge.[12]
Very few participants use the teeth whitening agents, among which most use the teeth whitening toothpaste. According to them, they achieve their desired results and most of them started using the product after watching an advertisement and without consulting dentist whereas the teeth whitening agents should be used for limited period of time and in the supervision of dental professionals.[13] Also they don't know the side effects of using the teeth whitening agent. Most of the people are satisfied and they get their required results and have not found any side effects with the use of the teeth whitening agents.
Many participants take analgesics on their own or homemade remedies for toothache. They only visit dentist when the situation gets worse e.g. when suffer from gingivitis or periodontitis. Most people complete their antibiotic course.
Hussaini et al. conducted a study in Kuwait University Health Sciences Centre to assess dental health knowledge, attitudes and behaviour among students. Study was based on the concept that good

oral health practice consists of continuous implementation of two broadly defined sets of behaviour: self-care habits and utilization of dental services. The results showed that students considered mainly tooth brushing to be effective measure for good oral hygiene. Students were satisfied with their oral hygiene due to which they didn't feel the need for regular dental checkups and only visited dentists in real need.[14]

Zafar et al. have assessed the awareness of over the counter products. However, this study used a very limited, small sample.[5]

The current survey assessed the knowledge of general population regarding the commercially available dental products. It has three sections. Section A was regarding the knowledge and use of basic dental products such as toothpaste, mouthwash, tooth powder, dental floss and miswak Section B was regarding use of any kind of teeth whitening agents and Section C was regarding general practices related to analgesics (pain killers), home remedies and antibiotics. The section regarding diet for good oral health in Hussaini et al. study was eliminated in current survey.

A cross sectional study design was chosen because of limited time duration and financial resources. Due to limited time and resources random sampling couldnot' be done and sample size was small and we conducted the research in some colleges of Islamabad and the ratio of male and female participants could not be matched but all participants initially contacted completed the questionnaires and there was no loss to follow up.

This research should be done with multi-sectoral collaboration in Islamabad and other cities and sampling should be done by systematic randomization. Number of males and females in sample should be according to the population of the respective area so that attitude and knowledge difference in both genders can be evaluated. In future, another research can be done by first assessing the knowledge of the sample and then educating them and then assess their knowledge again so that impact of knowledge can be measured and this intervention can be done on larger scale.

Conclusion

Generally people in selectedinstitutes of Islamabad have the knowledge about the use of the dental products that are commercially available. But they visit the dentist only when once their symptoms aggravated. Self-medication still needs to be addressed and awareness about the harmful effects of whitening agents and self-medication should be spread among the general population.

Awareness should be developed regarding self-prescription of analgesics and regarding the importance of completing an antibiotic course. In short, a habit of asking a dentist first should be developed.

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ORIGINAL ARTICLE

Perception of Undergraduate Medical Students about Ethics and Medical Jurisprudence

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ABSTRACT

Objective: To determine the importance of teaching medical ethics and medical jurisprudence as a part of curriculum.

Study Design: Descriptive survey based Study.

Place and Duration of Study: The study was conducted from June 2014 to December 2014 at Islamic International Medical College, Rawalpindi and Foundation University Medical College Islamabad.

Materials and Methods: One hundred and seventy seven students from 3rd year MBBS were included in this quantitative questionnaire based survey. A questionnaire of 22 items was adopted from the literature, validated by piloting among faculty members, modified accordingly and was self-administered. The data was entered into SPSS version 20 and analyzed by frequencies, cross tabulations and graphs.

Results: The results indicate that 47% students find studying medical ethics interesting and informative, 54% think that it increases awareness, and 62% find it effective in clinical problems. Majority of students are able to make ethical decisions about issues e.g patient's consent, discontinuation of artificial life support, patient decision regarding termination of its life, receiving gifts from pharmaceutical companies, offering life support, organ donation and commercialization of health sector.

Conclusion: The study concludes that medical ethics and medical jurisprudence are importantcontent of curriculum to be taught at undergraduate level.

Key Words: *Medical Ethics, Medical Jurisprudence, Perception, Curriculum.*

Introduction

Medical ethics is as old as medical profession but has remained as the 'hidden' curriculum of medical education. Ethics has been a part of medical practice since the time of Hippocrates however it is still an undiscovered entity[1] Ethics is the application of moral values and rules to human activities[2] and its application to health care system, The American Association of Medical Colleges and the General Medical Council maintain that the ethics education should be a core component of curricula, and medical graduates must have the knowledge of theories and principles of bioethics, and skills for ethical decision making.[3,4]

The purpose of teaching medical ethics is to create virtuous physicians and develop skills to analyze and resolve ethical dilemma.[5]The medical ethics education has been shown to have positive impact on moral development and make complete and better doctors.[6] Forensic Medicine is the only subject at the Undergraduate level which teaches not only medical ethics but also imparts knowledge about medical Jurisprudence. The curriculum taught in third professional year of MBBS. According to Pakistan Medical and Dental Council (PM&DC), aims to produce such physicians who are well informed about the medico-legal responsibilities in the practice of medicine. But over the time a discussion is being generated whether to keep Forensic medicine in the curriculum of under graduation or to transfer it to Post graduate level. This could be a serious drawback to our health sector by deteriorating moral values and ethical practices leading to decline of professionalism of the Medical Doctors. In this globalized world we cannot leave our health sector unattended. This will never let us achieve the Millennium development goal in the health sector of Pakistan. The main drive behind our study is to do in depth analysis of perception and awareness of students who are taking this course and to highlight the importance of Forensic Medicine

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as an Undergraduate subject. There is less research undertaken in this area in context of Pakistan. Only one study is found by Qadwai and Qureshi in year 2001[2] which was focused on general practitioners. This generates the need to explore the perception of under graduate medical students about importance of medical ethics and jurisprudence. The present study has tried to fill this gap by highlighting the significance of teaching the subject of Forensic Medicine at the undergraduate level. The present study update their analysis with latest data of 2014 with larger sample of 177 respondents and extending it by incorporating the scenario based approaches and stressing on the importance of the subject of Forensic medicine as a part of Undergraduate curriculum. This study, on one hand, contributes to the Medical Ethics and Jurisprudence and on the other hand contributes to the field of Medical Education.

Materials and Methods

It was a descriptive survey based study conducted among undergraduate medical students of the two private sector institutions, i.e. Islamic International Medical College, Rawalpindi and Foundation University Medical College, Islamabad in the month of June 2014. Initially a total of 200, third year students were selected who had studied subject of Forensic medicine. Out of 200 questionnaires,23 were not considered due to incomplete information. Study was done on a sample size of (n-177).Aclose ended questionnaire of 22 items was adopted from the literature. It was validated by piloting among faculty members, modified accordingly and was self-administered. Students included in the study were given a brief introduction of the study. Data was entered into SPSS version 20 and analyzed by frequencies, cross tabulations and graphs.

Results

A total of 200 undergraduate medical students from two private sector medical colleges of Rawalpindi and Islamabad were surveyed. Our responders (n=177) include 69% females and 31% males. Mean age was 22 years. Majority of our responder's i.e. 65% belong to province of Punjab. Results have been tabulated in the two tables below. Table II lists the demographic profile of the respondents. Table I shows the results of knowledge and attitude of

Table I: Knowledge and attitude of undergraduate medical students on the ethical issues

	Agree	Neutral	Disagree
I find that the studying of medical ethics has enabled to be well informed regarding the current ethical issues.	54%	27%	19%
I find studying forensic medicine effective in clinical problems.	62%	9%	29%
I have to take consent from my patient before starting health care intervention.	86%	9%	5%
It is ethical not to disclose diagnosis to terminally ill cancer patient.	41%	27%	32%
It is ethical to let a suffering patient decide about ending its life in order to reduce its pain.	28%	26%	46%
It is unethical to reveal any information about patient's health to patient's relatives without his/her permission.	71%	16%	13%
A pregnancy can be terminated if there is serious threat to mother's life.	84%	13%	3%
I should not offer life support to patient with no chance of survival.	25%	25%	50%
It is unethical to accept gifts or favors by pharmaceutical companies in expense of prescribing their drugs.	50%	24%	26%
It is ethical to take consent of patient before using it as a subject of research and to explain its potential benefits and risks.	71%	10%	19%
It is unethical for rich person to buy organs from poor person for saving his/her life.	52%	21%	27%
One reason that doctors are not following medical ethics is the commercialization of the health sector.	60%	25%	15%

Note: The questionnaire is developed by the authors.

Table II: Demographic Profile of Respondents (N=177)

Parameter	Number/ Percentage	Parameter	Number/ Percentage
Gender		Family Income	
Male	31%	High	52%
Female	69%	Middle	44%
Mean Age	22 years	Low	4%
Father Education		Domicile	
High	46%	Federal	14.6%
Middle	40%	Punjab	65.2%
Low	14%	Sind	9%
Mother Education		KPK	10.1%
High	24%	Baluchistan	6%
Middle	44%		
Low	32%		

undergraduate medical students on the ethical issues. Table III displays opinion of respondents regarding medico legal issues.

Results of the awareness among students regarding medical ethics and medico-legal issues reveal that 47% of the respondents find studying medical ethics and medico legal issues interesting and informative. Cross tabulation shows that among them 32% are males and 68% are females. Respondents with educated parents have higher awareness as compared to respondents with less educated parents. Results of cross tabulation of parents' education show 84% are more aware and 16% less aware.

About 54% of respondents think that studying of this subject has enabled them to be well informed regarding the current ethical issues. The 62% find studying forensic medicine effective in clinical problems. Only 13% find it irrelevant and 39% just common sense. The 86% agrees to take consent before starting a health care intervention.

The 41% agree that it is unethical to disclose diagnosis of terminally ill cancer patient. Less than 30% think it is ethical to let a suffering patient decide about ending its life in order to reduce pain. Most of students, 71% agrees not to disclose patient's diagnosis or treatment without patient's consent even to the closest relative. Majority of 84% agrees that a pregnancy can be terminated if there is serious risk to the life of the mother. According to our results, 25% agree not to offer life support if patient has no chance of survival. Half of the students think it is unethical to accept gifts from pharmaceutical companies in exchange of prescribing their medicine. 52% find it unethical for a rich person to buy organ from a poor person for saving his/her life.

Table III: Opinion Regarding Medico-legal issues

	Yes	No	Do not Know
Can only authorized doctor perform a medico legal autopsy?	78%	8%	14%
Should I take consent of relatives for a medico legal autopsy?	55%	28 %	17%
Should I issue sickness certificate to apatient who is not under my care?	17%	65 %	18%
Is a printed consent form for a surgical procedure available at your hospital?	51%	15 %	34%
Should I take consent of an adult victim of sexual assault before physical examination?	71%	9%	20%

Results of medico-legal issues show that 78% agreed that autopsy can only be performed by a registered medical officer. 52% know that a printed consent form is available for surgical procedure in their hospital. 72% know that on a victim of sexual assault physical examination cannot be carried without consent. 64% understand the concept of dying declaration. 28% know that there is no need of consent of relatives in the case of medico-legal autopsy. The 65% know that it is unethical to write sickness certificate to a patient who is not under their care.

Discussion

The awareness of the Medico-legal issues is important for the undergraduate students as they are the future of the health sector and the subject of Forensic Medicine provides a foundation for this purpose. There are other studies which highlight the importance of the same issue as well. The study done by Sheikh and Khan in 2010 have assessed the knowledge, attitude and practice of medical teachers regarding medical ethics in a medical university of Karachi, Pakistan.

Most important ethical issues asked where about, consent, organ donation, and mercy killing, issuing false medical certificates and receiving gifts from pharmaceutical companies.

Majority of the students agree to ask for consent when taking a patient as a subject to research and to explain all the pros and cons of the research. The process of informed consent has two objectives. One objective is the completion of the physician or hospitals' legal requirement while the other is the

fulfillment of the physicians' moral obligation.[7] The requirement for an informed consent is well established in all decision making situations both clinical as well as research in which human subjects are invited to participate.[8]

It is unfortunate that the issue of the discontinuation of artificial life support to patient with poor prognosis is controversial.[2] Issue of mercy killing and euthanasia should be highlighted because it is one of the major ethical issues worldwide. Opinion about organ donation was that 51% finds it unethical for a rich person to buy organ from a poor person for saving his/her life. Placing living donation within an ethical framework can allow for careful consideration and guide decision making in each individual case.[9] The important finding of study is that majority of students believe that commercialization of health sector is important reason for poor practice of medical ethics and laws by the health professionals.

In our set up Medico-legal cases are often not autopsied, especially in rural areas.[10] Due to wrong Medicolegal reporting injustices are occurring daily. 78% students know it well that autopsy should be performed by a registered medical officer. Future medical officers must have basic knowledge of ethical and legal requirements to meet the demands of the state in execution of justice. Regarding issuing false medical certificates, it must be realized that patients are a stronger controlling element then the general practitioners in the process of certification of sickness.[11] Qadwai and Qureshi (2002) have also come to the same conclusion.

In some cases ethical theories and principles do not help physicians in resolving conflicts; other approaches to clinical ethics have been suggested.[12] Instead of relying on theories some writers resolve dilemmas by looking at the concrete details of a particular case.[13] Emphasis should be given on educating our students on modern ethical grounds based on our own ideology.

The limitation of our study is that it only focuses on two cities and for two private sector medical colleges. In future this study can be extended by increasing the sample size, by including public sector colleges and by taking a nationwide sample.

Recommendations

Increased unethical and illegal practices in hospitals are an emerging issue and are gaining importance over the time. The study concludes that medical ethics and jurisprudence is very important content to be taught at undergraduate level. Forensic Medicine is the only source for it. It makes health professionals stronger and capable of handling serious clinical emergencies regarding medico-legal issues. Limiting this subject to a Postgraduate specialty will deprive most of our doctors of the knowledge and awareness of the basic ethical values. Therefore, authorities should consider the importance of the subject of Forensic Medicine and keep it as an essential part of undergraduate curriculum.

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ORIGINAL ARTICLE

Effects of Cell Phone Radiations on the Metanephros Tubules in a Chick Embryo Model

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ABSTRACT

Objective: To determine the histomorphogical effects of radiations from conventional and advanced mobile phones on the developing kidney of chick embryo.

Study Design: Randomized Control Trial.

Place and Duration of Study: The study was conducted at Army Medical College, (NUST), Rawalpindi, Pakistan from January 30, 2012 to January 30, 2013.

Materials and Methods: Fifty fertilized, zero day, off white colored eggs of Fayoumi breed were selected according to inclusion criteria. Two groups II and IV were exposed to conventional mobile phone radiations, and two groups III and V were exposed to advanced mobile phone radiations for 15 and 30 minutes per 24 hours respectively. Group I was the control. The data was analyzed by SPSS 17 and, ANOVA test was applied to determine statistical significance.

Results: The mean proximal and distal tubular diameters were decreased in the experimental groups. The mean proximal tubular diameter decreased significantly when comparing group I with groups II, III, IV and V and no statistical significance was found when comparing the experimental groups.

The mean proximal luminal diameter decreased in experimental groups with statistically significant result between groups I and III and between I and V showing that the effects were more in advanced cell phone groups when compared with the control.

Regarding distal tubular diameter the results were statistically significant between I and III, II and III and II and IV. Mean distal luminal diameter decreased in the experimental groups with statistically significant result when comparing II and IV and, IV and V. The distal tubules responded to either the increase in the time of exposure from 15 to 30 minutes or when the chick embryo was exposed to advanced cell phone radiations as the results were more significant between the experimental groups, where $p<0.05$ was considered significant.

Conclusion: From this experimental study we can conclude that prolonged exposure to mobile phone radiations can lead to decrease in tubular as well as luminal diameter in the proximal and distal tubules of the developing kidneys of chick embryo.

Key Words: *Mobile Phones, Chick Embryo, Metanephros.*

Introduction

The electromagnetic radiations from the mobile phone are classified as 2B, by international agency for cancer research (IARC), which means it is a possible carcinogenic. There have been a number of epidemiological studies conducted, looking for a relationship between cell phone use and brain cancer development. One such interphone study was carried out by Cradis E et al, (2010) to observe the association of gliomas, schwanomma, parotid tumors and meningioma.[1] The results were unconvincing because of the faulty study design and methodology. An increased risk of glioma after ten years or more use of cell phones was reported in a study carried out in Germany[2] Moreover, another study showed that there was no risk of acoustic neuroma in the first ten years of cellular phone use.[3]

In some studies, the harmful effects of these radiations were seen. The reproductive capacity of drosophila melanogaster was observed to be decreased after mobile phone radiation exposure.[4] A study was conducted on 77 university students and deranged values of TSH and T4 were found.[5] In few studies the radiations were useful like in bone healing[6] and in some, there were found no increased risk of salivary gland tumors because of the mobile

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phone induced radiations.[7]

The effects of increased usage of these modern and advanced cell phones have been questioned by Agarwal et al.[8] Who studied the effects of cell phone radiation on male fertility. Prenatal exposure of 900MHz to rat kidney resulted in increase in kidney volume and decrease in number of glomeruli (Ulubay, 2015).[9]

The current study was conducted to observe and compare the effects of the radiations from the two types of cell phones. One using conventional mobile phone, will be exposed to the GSM radiations, whereas the advanced mobile phone user will be exposed to both type of radiations as it is used for multipurposes (voice and message communication, internet usage).

As cell phones are kept close to body, the kidneys are essentially exposed to the radiations. The developing tissue is exposed as well, and the pregnant women are prone to get exposure and can later have an effect on the developing fetal tissues. The study was conducted to observe how cellular radiations can effect the renal histomorphology of a developing renal tissue. The additional features in a cell phone expose the tissues to radiations of Wi-Fi and Bluetooth. Keeping in view, the study was conducted to observe the effects of the simple and conventional talk and text cell phones and, advanced and modern cell phones on the developing renal tissue.

Materials and Methods

The study was carried out in Army Medical College Rawalpindi in collaboration with Poultry Research Institute Rawalpindi for one year 30th January 2012 to 30th January 2013. The experiment was carried out with permission of ethical committee on animal experiments, of the Army Medical College, Rawalpindi. It was a randomized lab based control trial. Fifty fertilized eggs were divided into five groups, by simple random sampling.

A still-air incubator which was wooden and manual, with measurements of 24 inch (length) x 24 inch (width) x 12.5 inch (height) and having capacity of 100 eggs was used for the project. Zero day eggs were bought for experimental purpose. Fertile eggs of normal shape i.e., oval, off-white colored and medium sized of Fayoumi breed were selected and incubated at 37 ºC and humidity range of 50- 60%.[10] Unfertilized, refrigerated, abnormal shaped eggs (foot-ball shaped, pear shaped), eggs with color other than off-white and, tiny sized eggs were excluded.

Group I (control), Group II (Experimental, 15 minute GSM radiation exposure), Group III (Experimental, 15 minute GSM and Wi-Fi radiation exposure), Group IV (Experimental, 30 minute GSM radiation exposure), Group V (Experimental, 30 minute GSM and Wi-Fi radiation exposure). The temperature was monitored by mercury thermometer. The humidity was maintained by filling the plastic pans with water and monitored by hygrometer. The eggs were marked with 'X' on one side and 'O' on the other side with lead pencil so that egg turning is not missed. They were turned thrice a day manually, after every eight hours. The time of exposure to GSM radiations was 15 minutes (23 missed calls) and 30 minutes (45 missed calls), daily, in the II and IV groups In groups III and V, the GSM exposure was for 15 minutes (23 missed calls) daily. In group III, Wi-Fi radiations were induced by downloading files for 15 minutes. In group V, the time of exposure to GSM radiations was 30 minutes (45 missed calls) and to Wi-Fi radiations was also 30 minutes daily.

After 15 days incubation, the chick embryos were dissected by crack opening the shell at the broader end. The inner and outer shell membranes were removed and, the living embryos were decapitated and fixed in 10 % formalin for 48 hours and after fixation. They were dissected and the kidneys were exposed in the posterior abdominal wall of the chick embryo. Then they were processed and embedded. Tissues were cut into 5 microns thick sections. The sections were stained with Hematoxylin and Eosin (H&E) for routine histological study of kidney (Fig 1) and PAS stain to see the basement membranes and brush border of cells.

Micrometry was carried out for measurement of the diameters and epithelial height.

Maximum tubular diameter was taken from the basement membrane of the cells on one side to the basement membrane of the cells on the opposite side in rounded tubules. Three tubules in were selected randomly in three different fields (one tubule in one field) at X40 in one slide per specimen. The external diameter of tubule was measured by oculometer. Three readings per slide were taken and their average as final reading for that specimen.

Maximum luminal diameter was taken from the apical surface of one cell to the apical surface of the opposite cell in the rounded tubules and same procedure repeated.

The data was entered in data base using start package for social services (SPSS version 17). The results were expressed as mean and standard error of mean. The significance difference was determined using one way analysis of variance (ANOVA) for multiple comparisons. Results were considered significant at $p<0.05$.

Results

The (H&E) stained slides were observed for changes in the histomorphology of developing metanephros of chick embryo.

Mean tubular (external) and mean luminal (internal) diameters of proximal tubules in the control group, in metanephros were 40.53±.08µm and 12.51±1.00µm respectively.

The proximal tubular diameters were decreased in all the experimental groups. The mean proximal tubular diameter in the metanephric tissue of the experimental groups is mentioned in table Ia. The results of proximal tubular diameters were statistically significant when comparing control group I with the experimental groups and comparable between groups II and III, II and IV, and III and V.

The mean proximal luminal diameter in metanephric tissue of experimental groups are mentioned in table Ib. The results were statistically significant between groups I and III and between I and V (Table I).

Mean tubular (external) and mean luminal (internal) diameters in the distal tubules of the control group in the metanephric tissue were 25.84±1.04µm and 9.06±0.38µm respectively.

The mean distal tubular diameter of the metanephric tissue in experimental groups are mentioned in table IIa. The values of mean in experimental groups were lower than the control group.

The results of distal tubular diameter of metanephros were decreased in the experimental groups and statistically significant between groups I and III, groups I and V, groups II and III and between groups II and IV.

The mean distal luminal diameter in the distal tubules of metanephric tissue in experimental

Table Ia: Proximal tubular diameter in control and experimental groups II, III, IV and V (metanephros)

Groups	Proximal tubular diameter Mean ± SEM (µm)	Comparison	P-value
I	40.53±0.81 µm	II	0.008
		III	0.000
		IV	0.000
		V	0.000
II	37.07±0.54 µm	I	0.008
		III	0.000
		IV	0.005
III	30.30±0.41 µm	I	0.000
		II	0.000
		V	0.093
IV	33.33±0.77 µm	I	0.000
		II	0.005
		V	0.997
V	32.97±0.85 µm.	I	0.000
		III	0.093
		IV	0.997

Table Ib: Proximal luminal diameter in control and experimental groups II, III, IV and V (metanephros)

Groups	Proximal luminal diameter Mean ± SEM (µm)	Comparison	P-value
I	12.51±1.00 µm	II	0.48
		III	0.008
		IV	0.26
		V	0.003
II	11.16±0.14 µm	I	0.48
		III	0.34
		IV	0.99
III	9.55±0.38 µm	I	0.008
		II	0.34
		V	0.99
IV	10.82±0.52 µm	I	0.003
		II	0.99
		V	0.34
V	9.16±0.31 µm	I	0.003
		III	0.99
		IV	0.34

Table IIa: Distal tubular diameter in control and experimental groups II, III, IV and V (metanephros)

Groups	Distal tubular diameter Mean ± SEM (µm)	Comparison	P-value
I	25.84±1.04 µm	II	0.62
		III	0.000
		IV	0.045
		V	0.006
II	27.47±1.07 µm	I	0.62
		III	0.000
		IV	0.02
III	18.54±0.69 µm	I	0.000
		II	0.000
		V	0.15
IV	23.68±0.65 µm	I	0.045
		II	0.02
		V	0.36
V	21.42±0.29 µm	I	0.006
		III	0.15
		IV	0.36

Table IIb: Distal luminal diameter in control and experimental groups II, III, IV and V (metanephros)

Groups	Distal luminal diameter Mean ± SEM (µm)	Comparison	P-value
I	9.60±0.38 µm	II	0.75
		III	0.06
		IV	0.29
		V	0.76
II	9.06±0.45µm	I	0.75
		III	0.13
		IV	0.03
III	7.91±0.15µm	I	0.06
		II	0.13
		V	0.16
IV	10.51±0.15µm	I	0.29
		II	0.03
		V	0.03
V	9.04±0.38 µm	I	0.76
		III	0.16
		IV	0.03

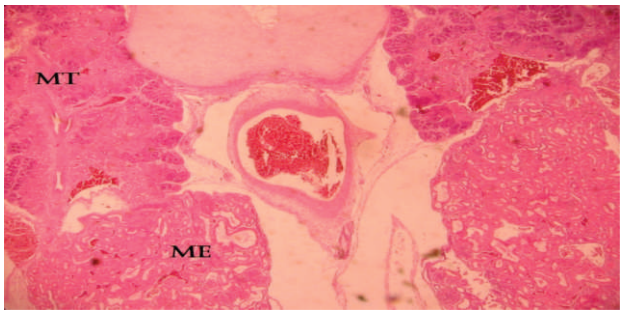

Fig 1: Photomicrograph showing mesonephros (ME) and metanephros (MT) in control group, lumen of tubules of mesonephros is more prominent (H&E, Approx. X 200)

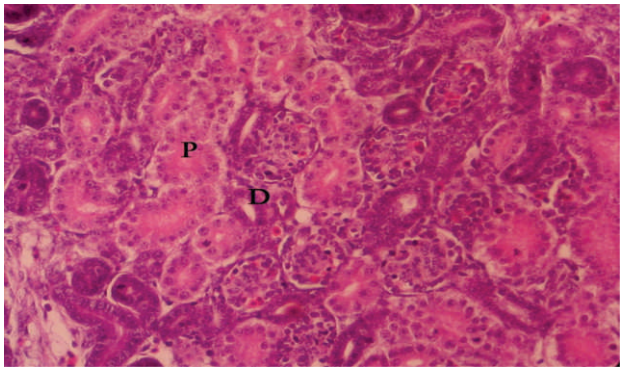

Fig 2: Metanephros in control group at 400X, H&E, P=Proximal, D=Distal Tubules

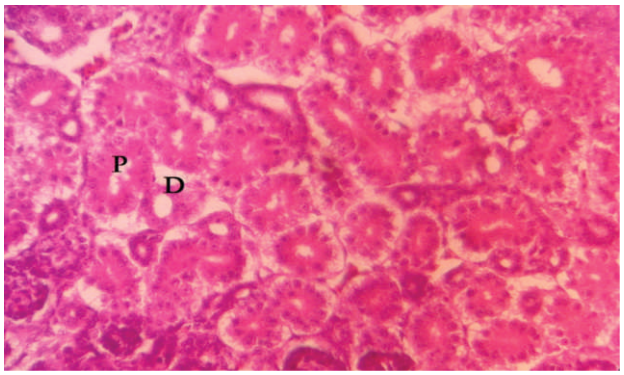

Fig 3: photomicrograph of metanephros in experimental group (iv), (H&E, Approx. X 400) P; proximal tubule, D; distal tubule

groups is mentioned in table IIb. The results were statistically significant between group II and IV and, group IV and V.

Discussion

The current study focused on the tubular and luminal diameter of the proximal and distal tubules of the developing metanephros. The tubular diameters were observed to be decreased in the experimental groups. The diameters decreased in all the experimental groups showing that there is effect of electromagnetic radiations on the diameters of developing tubules. In case of proximal tubular diameter the results showed that the diameter decreased statically in experimental groups than the control and proximal luminal diameter decreased also in the experimental groups with statistically significant result between I and III and I and V showing advanced cell phone radiations was affecting the internal diameters.

The mean distal tubular and luminal diameters decreased in the experimental groups but a trend of added decrease in mean diameter of tubules both externally and internally was noted in the group III.

That led to an aspect of study already seen in effects of GSM radiations on chick embryo growth in which EMFs exposure to them delayed the process of growth in the exposed embryos, there was a partial and then a trend of growth enhancement on progressively increasing the exposure levels was noticed.[11] The tubules appeared to recover from growth disruption after increase in the time of exposure as seen in the propensity of increase in the mean diameters in group IV and V in both proximal and distal tubular diameters. Hence, the advanced cell phone radiations after 15min/day exposure for 15 post-incubation days affected the development of the tubules of metanephros by decreasing their diameters hence, retarding the growth more as compared to conventional mobile phone radiations. Whereas, after 30min/day exposure for 15 post-incubation days, the tubular diameters showed improvement, depicting growth enhancement, that was more prominent after exposure to conventional mobile phone radiations than after advanced mobile phone radiations exposure.

Al-Glaib (2008)[12] observed increase in the tubular diameters in mice kidney because of GSM mobile phone radiations but Accini et al in 1988 in his study on effects of electromagnetic radiations on rabbits observed necrosis of the renal tubules.[13] Degeneration of renal tubules was noted in a study after exposure to electromagnetic radiations in mice for, 12 days.[14]

Moreover, study can be conducted further on other developing tissues in chick embryo or other animal model and effects can be correlated.

Conclusion

From this experimental study we can conclude that prolonged exposure to mobile phone radiations can lead to decrease in tubular as well as luminal diameter in the proximal and distal tubules of the developing kidneys of chick embryo.

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CASE REPORT

Parvo B 19 Myocarditis in Immunocompetent Patient

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ABSTRACT

Parvo B 19 virus can cause different diseases in human. It can cause myocarditis which if not treated in time can prove fatal. Here we are presenting a case of 43 years old immune-competent male who was found to be infected with Parvo B 19 virus, which was diagnosed by positive serology and PCR technique. He was successfully treated and ison regular follow up. Every clinician should consider the possibility of PVB 19 in any patient presenting with acute myocarditis.

Key Words: *Myocarditis, Parvo B 19 Virus.*

Introduction

Parvo B 19 is the only member of family parvoviridae,discovered in 1974 and is pathogenic in humans.[1-3] It can cause fatal myocarditis leading to heart failure if not treated in time.[4-6] We are presenting a case of parvo B 19 myocarditis who presented with acute myocarditis and was successfully treated with antiviral therapy andinotropic support.

Case Report

A 43 years old serving soldier presented with one week history of flu like illness, dry cough, low grade intermittent fever with myalgia. He took treatment from some local general practitioner buthis symptoms did not resolve. After about 3 days, he also developed signs of acute heart failure which were progressive and found to be NHYA Class IV accompanied by orthopnea and frothy sputum.

His past, personal, social, drug and family history were insignificant. Physical examination revealed pulse of 90/minute which was irregularly irregular, low volume. BP was 90/75 mmHg with no postural hypotension, temperature 990 F and respiratory rate of 20/minute. Chest auscultation revealedbilateral few basal creptitations. ECG showed AF, LAD,LBBB, T wave inversion in I, II,III,avl,avfand V3 to V6.Blood complete picture showed lymphocytosis. Blood Culture and Sensitivity, CRP, Sputum AFB, Urine R/E and C/S, USG Abdomen, Trop T, CK MB, AST, LDH, RFT, LFT, Serology for EBV, CMV, adenovirus and enterovirus and angiography were all normal. 2 D Echo showed EF 20 %with dilated LA, LV and severeLV systolic dysfunction, global hyperkinesia with no effusion. Parvo B 19 virus IgM was positive and was further confirmed by PCR. Cardiac MRI showed increased signal intensity at septal wall on T2 weighted image. Myocardial perfusion SPECT with T1-201 after physiological stress and at rest revealed fixed perfusion defect (partial thickness MI/scarred myocardium of inferior wall) and multiple areas of moderate to severe fixed defects scattered all over left ventricular myocardium plus severe global hyperkinesia with 20 % EF and poor LV function.

He was admitted in intensive care unit and was treated with IV diuretics and inotropic support. He remained admitted in hospital and became stable in one week.His EF improved to 55% after one week of treatment. He was discharged after ten days of hospitalization and PVB 19 IgM was repeated at the time of discharge, which was negative with negative PCR.

At the time of discharge he was advised ACEinhibitors, digoxin, beta blockers, and low dose aspirin. He was properly counseled regarding his illness and follow up.

Discussion

Acute myocarditis is aninflammatory condition of myocardium due to various pathogens.[1] Patient can present with different clinical features which may be fulminant or non-fulminant. Different infections, drugs, toxins and systemic diseases have been found to cause myocarditis.[2] Parvo B19 virus, humanherpes

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virus 6 and enterovirus are some of the most common viral causes of acute myocarditis. PVB19 can cause fatal myocarditis because it affects myocardial endothelial cells.[3] Clinical features can vary from simple flu like illness to heart failure, arrhythmias or pseudo myocardial infarction.[4] Myocarditis is found in 42% of cases with unexplained deaths in individuals under 35 years of age. Exact incidence and prevalence of fulminant myocarditis is not known but it is seen in 10 % of biopsy proven myocarditis.[1,5-8]

An accurate and rapid diagnostic approach is very crucial in the management of viral myocarditis. Serology, Cardiac MRI, Angiography and Cardiac biopsy are some of the crucial diagnostic investigations.[6] Additional viral PCR (quantitative) and for viral genome and immunohistochemistry for cardiac inflammation and necrosis also help in diagnosis.[6-8] This will help in accurate diagnosis and targeted treatment. When diagnosis is confirmed, treatment of underlying cause is the main life saving step. In addition to specific treatment of the underlying cause, intense hemodynamic support likeinotropic support, intra-aortic balloon pumps and ventricular assistance devices can also be used to save life of the patient depending upon the clinical condition of the patient. Heart transplantation is the last option in developed countries where facilities are available.[7,8]

Seven percent of the patients presenting with fulminant myocarditis will have fatal outcome.[2,5-7] Mortality rates are different due to various patient risk factors.[5,7-8]After acute phase of treatment, patient should be managed with standard heart failure medications with beta blockers, Angiotensin-converting enzyme inhibitors, Angiotensin receptor blockers (ARBs), Calcium channel blockers (CCB), and Digoxin. Regular follow up is very necessary as recurrence has been reported.[5-7]

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