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Aims & Scope

The Journal aims to publish research in all fields of clinical, diagnostic, experimental & preventive areas related to medical sciences to disseminate scholastic work among clinicians and scientists around the globe.

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Research Articles

Research article

Risk Factors for Ischemic Heart Disease (IHD) Among Young and Old Age Groups Patients of District Peshawar

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Abstract

Ischemic heart disease (IHD) is an important health care problem worldwide. Various associated risk factors have been identified for the disease. Prevention of these risk factors in the public may improve the attributed mortality rate. To determine the most frequent risk factors among IHD patients of District Peshawar, Pakistan. A descriptive cross-sectional study design was adopted for this study. Adult IHD patients were recruited from two tertiary healthcare centers of Peshawar, KP Pakistan. The study patients were divided into two age groups. A questionnaire depicting demographic and clinical details of the patients was filled out for each patient. The data collected was compared between the two age groups employing SPSS version 22. A majority of the younger age group patients lacked in exercise. Smoking and hypertension were also found to be more frequent, in respective order, than other risk factors among younger age group patients. High body mass index (BMI) was the most frequent finding in the older age group patients, followed by consumption of fatty diet. Inactivity, smoking, and HTN were
most frequent risk factors found in young adult CAD patients of KP, whereas fatty diet and a consequential high BMI were the most frequent findings among the older patients.

Introduction

Ischemic heart disease (IHD), also designated as coronary artery disease refers to a group of closely related syndromes caused by an imbalance between myocardial oxygen supply and its demand[1]. In more than 90% of cases it is a consequence of decreased coronary blood flow secondary to obstructive atherosclerotic vascular disease[2]. In less frequent cases it results from increased oxygen demand (hypertension), diminished blood volume (pneumonia or CHF) or diminished oxygen- carrying capacity (anemia or Carbon monoxide toxicity). The non-modifiable risk factors include age, gender and positive family history. The modifiable risk factors include hypertension (HTN), smoking, stress, diabetes mellitus (DM), obesity and sedentary lifestyle[3]. IHD is considered a modern epidemic by WHO in 1982[4]. In 1999 over 33.3% of all deaths in the US were due to IHD. It additionally accounts for more than 18% of disability adjusted life years (DALY) in high- income countries and more than10% DALY in middle and lower- income countries[5].
Indo-Asian nations are reported to have the highest rates of CAD, worldwide[6].In a previously conducted study, the Mortality rate in Pakistani population due to CAD was reported to be 410/100000 deaths per year[7]. The disease has been reported to pose a great amount of burden on health care system in various populations around the world[8]. Studies' depicting the frequency of various risk factors in different age groups of local CAD patients belonging from the province of KP is lacking. The current study was hence aimed at elucidating this data. Findings of the study will help the authorities and concerned health professionals in adopting appropriate preventive and curative measures. Thus this study was designed to identify the common risk factors of ischemic heart disease in the elderly and young patients from KP.

Methodology

This was a hospital- based descriptive cross-sectional study.IHD patients were identified at Khyber Teaching Hospital and Hayatabad Medical Complex, Peshawar. Both hospitals have well-developed cardiology units for patients with IHD. The study was conducted from April 2012 to September 2012. Adult patients of Pakistani origin with IHD of either gender were selected. The patients were divided into two age groups, i.e. >45 years and ≤45years. Owing to the corresponding prevalence of patients in the respective age groups, the >45yrs age group was assigned 100 patients

while the ≤45 years age group was assigned, 50 patients. Those with concomitant congenital heart diseases or other syndromes were excluded from the study. A comprehensive questionnaire, taking into account the demographic details and assessment for various IHD risk factors were filled out for all the patients by appropriately trained healthcare professionals. The data was recorded and interpreted with the help of SPSS(version22). Chi-square test was employed in comparison to qualitative variables among study patients; the coefficient interval was kept at 95%.

Results

A total of 150 IHD patients, 100 in the older adults age group of >45 years and 50 in the younger adults age group (≤45 years), were enrolled in the study. Among the study patients, 85 regularly performed exercise. The details regarding the kind and duration of exercise was not obtained. Sixty-five patients did not observe exercise at all; a majority (n=32,64%) of these were from the younger age group(Table1). On the contrary, 67% of those from older age group exercised regularly.

In this study, we found a significant number of patients (n=55, 36.66%) had been smoking cigarettes (Table1). The frequency of smokers was significantly higher (p value 0.042) in the patients from younger age group (48%).

Dietary history was obtained and compared between the two age groups. It was found that a majority of the patients in either age group took fatty diet; the difference, however, was statistically insignificant (p value 0.9). Diabetes is a well-known risk factor for IHD. In the current study, a total of 51(34%) patients were suffering from DM. The frequency among patients from the young age group was especially high (48%) as compared to the older age group patients (27%). The difference between the two groups, however, was statistically insignificant (p value 0.10). Hypertension is another leading risk factor for IHD. In the Current study, a significantly higher number of patients (n=85,56.66%) was suffering from this disease. The frequency was significantly higher among patients from younger age group, i.e.78%, in comparison to those from the older age group (46%). Subjective mental stress was comparable among the two age groups (Table1). Similarly, a non-significant difference was obtained among the two groups when compared for different body mass index (BMI) status (Table1). A previous history of IHD in the family among blood relatives was also comparable between the two age groups (Table 1).

Table 1. Frequencies of various IHD risk factors among young and adult age groups

Study parameter		Young Age Group n(%)	Old Age Group n(%)	P-value
Exercise	Yes	18(36)	67(67)	<.001
	No	32(64)	33(33)	
Smoking	Yes	24(48)	31(31)	0.042
	No	26(52)	69(69)	
Diet	Balanced	23(46)	47(47)	0.9
	Fatty	27(54)	53(53)	
DM	Yes	24(48)	27(27)	0.10
	No	26(52)	73(73)	
HTN	Yes	39(78)	46(46)	<0.001
	No	11(22)	54(54)	
Mental Distress	Yes	16(32)	29(29)	0.705
	No	34(68)	71(71)	
BMI	Normal	15(30)	38(38)	0.393
	Over Weight	14(28)	31(31)	
	Obese	21(42)	31(31)	
Family Hx of IHD	Yes	18(36)	17(17)	0.729
	No	32(64)	83(83)	

BMI, body mass index; DM, diabetes mellitus; HTN, hypertension; Hx, history; IHD, ischemic heart disease

Discussion

The current study elicited frequencies of eight known IHD risk factors among younger and older adults of District Peshawar.HTN (n=39,78%) was the most frequently found risk factors in the younger age group patients. The incidence of HTN is on the rise in young adults suffering from IHD[9]. In a study conducted in Japan in 1990, HTN was reported as the most common IHD risk factor among young IHD patients[10]. Exercise has been reported to lower the incidence of IHD[11]. In the current study, lack of exercise was found to be the second most common IHD risk factor (n=32,64%) among patients from the younger age group. This may pertain to the relatively casual behavior at younger ages as compared to the older ones. In a previous study conducted on healthy individuals from other provinces of Pakistan, a higher frequency (17%) of lack of exercise was reported[12]. This advocates findings from the current study.

Among patients from an older age group, the most frequent risk factor was high BMI (62%). This parameter is already reported as a common risk factor among IHD patients[13]. The higher prevalence in the current study may be attributed to the increased consumption of a fatty died in this age group. Consumption of fatty diet was recorded to be the second most commonly found an IHD risk factor in older adults. The two age groups varied significantly for three IHD risk factors, i.e. lack of exercise, smoking and HTN. Regular exercise was more frequent among patients from older age group, whereas smoking was more common in the younger age group patients. Both these attributes pertain to the inherent casual behavior among young adults as compared to the older ones. On the whole, in the current study hypertension was the leading IHD risk factor (31.75%). Hypertension is a well- known risk factor for IHD worldwide[14].Various behavioral and genetic factors may lead to HTN[15]. An assessment of these are suggested in Pakistani population.

Conclusion

It was concluded that lack of exercise, smoking, and consumption of a fatty diet, DM, HTN, mental distress, high BMI and previous family history of IHD are all frequently found in IHD patients of district Peshawar. Lack of exercise and smoking are especially more frequent among young adults whereas consumption of fatty diet and consequent rise in the BMI are relatively more common in the older adults.

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Research article

Awareness and Practices Regarding Needle Stick Injuries Among Health Care Professionals: Findings at a Tertiary Care Hospital of Karachi

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Abstract
Assessment of the knowledge, attitude and practices of healthcare professionals (HCPs) regarding needle stick injuries (NSIs) at a tertiary care hospital in Karachi. This was a cross-sectional study, conducted among 404 health care workers at a tertiary care hospital in Karachi. A self -administered questionnaire was used to collect the data which was analyzed by using SPSS version 22.0. Out of 404 HCPs, 83.17% were actively involved in the human activity of distributing any kind of injection during their duties. A total of 117 (29%) study participants were sufficiently educated regarding NSI practices ($p<0.001$). Among the HCPs, 64.9% had never read the institutional guidelines regarding NSIs. A total of 253 (62.7%) HCPs had sustained a needle stick injury at least once in the last one year; 75% of them were previously immunized with hepatitis B vaccination. The level of awareness among HCPs at tertiary health care level at Karachi is not satisfactory. Frequent training workshops, teaching sessions and symposia should be arranged to promote awareness regarding NSIs among HCPs.

Keywords: Needle Stick Injuries (NSI), Health Care Professionals (HCPs), Tertiary Care, Hospital, Karachi.

Introduction
Health care professionals (HCPs) are at the highest risk to suffer needle stick injuries (NSIs). These injuries can transmit several viral infections, and can lead to serious morbidity and mortality [1, 2].Studies have revealed that almost three million out of thirty five million HCPs experience needle stick injury every year, worldwide[3]. The issue is of concern among both the developed and developing countries[4,5]. More than 20 types ofpathogens have been reported to transmit through NSIs; the most feared ones are hepatitis B virus (HBV), hepatitis C virus (HCV) and Human Immunodeficiency Virus (HIV)[6]. According to World Health Organization (WHO) 40% of HBV, HCV and 2.5% of HIV infections among HCPs are attributed to NSIs[3].
It has been, likewise, reported that HCPs do not stick with proper infection control techniques[7-9]. A majority of the inexperienced workers regularly perform recapping of needles; a majority of them, however, do not know the importance of utilizing personal protective measures[10,11]. The most likely reason to this menace is inadequate professional training regarding NSIs [11,12]. A basic aim of safe and efficient nursing care is to prevent and control infections. In the nutshell, NSIs pose a significant threat of infections to the HCPs in general. The issue is of special attention in communities which lack awareness and proper training in NSI handling. Gravity of this problem and the causative factors have not been investigated in local population as yet. Findings from this study would hence assist the authorities in taking appropriate preventive measures. Thus this study was designed to assess knowledge and practices regarding NSIs among HCPs.

Methodology
The cross-sectional study was conducted among the health care workers in tertiary care hospitals at Karachi.

Study Participants
Health care workers serving at tertiary health care hospitals in Karachi were randomly selected; those who consented were enrolled into the study. Health care workers of either gender and all age groups, dealing with syringes in diagnostic or therapeutic interventions, were included into the study.

Data Collection

Primarily incidence of NSI was assessed among different caders of health care workers. Questionnaires depicting awareness regarding NSI, preventive techniques and history of infliction, if any, were filled out for each patient by pre-trained individuals. NSI was defined as any cut or prick sustained by a needle previously used on a patient during execution of a medical procedure sustained within the hospital premises.

Data Analysis

The data was collected on questionnaires and transferred to the Statistical Package for Social Sciences (SPSS) version 22 for analysis. Arithmatic means and standard deviations were calculated from normally distributed continuous variables. Differences among the subgroups of variables were analyzed for statistical significance keeping the limit for confidence interval at 95%.

Results

A total of 500 health care workers were randomly selected of whom 404 consented and were enrolled into the study. These included 36 (8.91%) consultants, 77 (19.5%) house officers, 179 (44.3%) nurses, 77 (17.32%) TRNs/TRMs and 42 (10.39%) others. Table 1 presents general demographic and professional information of study participants. Among the study participants 269 were females while 135 were males. A majority of them, i.e. 52%, were from the age group 25 to 30 years. A total of 191 participants (47.3%) had a work experience of 2-4 years. Table 2 presents the proportion of at-risk healthcare workers and the NSI incidence rate among study participants. It was found that 88% (n = 358) were at risk of suffering from an NSI. A significant number of study participants, i.e. 251, had suffered from at least one incidence of NSI in the last 12 months. To elucidate the risk factors for infliction of NSIs, various administrative and intellectual factors were analyzed; these have been listed in Table 3. It was found that the participants lacked in their understanding of NSIs. is mainly pertained to the lack of proper education/training while at service. The incidences of NSIs were infrequently reported to the concerned department. The hepatitis B vaccination status among the healthcare workers was also unsatisfactory. Merely 28.70% participants were aware of the organizational/ hospital policies related to health and safety. Moreover, only 35.10% of the participants were following Personal Protective Equipment (PPE) guidelines, which is suggestive of a lack of knowledge among healthcare workers. Among the study participants, only 37.10% responded that they have a sharp box in the clinical setting they are working at; 25.2% of the respondents denied the presence of any such box in their work settings, whereas 37.7% admitted that they did not know if a sharp box exists in their setting ornot. In the current study we found that nursing sta was the most common cader of healthcare workers suffering from NSI, however, house officers were the most at risk for NSI. Consultants, in the other hand were the least at risk for NSI. Among the various age groups, those from 25-30 years age comprised majority of the cases. Males were found to have significantly increased prevalence of NSI in comparison to the female participants. It was also found that the inexperienced ones were the most at risk for NSI(Table 4). Upon further elucidation, it was found that the inappropriate understanding of NSIs among healthcare workers was mainly due to lack of training and awareness about institutional policies regarding NSIs (Table 5). Unfortunately, only 25.5% HCPs sustained NSI were trained. And only 32.6% out of the population that had “Needle Stick Injuries” were aware of organizational policies.

Discussion

In this study a higher prevalence rate of NSIs (n = 251, 62.10%) among HCPs was identified. This rate is significantly higher in comparison to studies conducted in the developed countries[13]. However, similar incidence rates have been reported in studies from the developing countries[14,15]. A previous study conducted in Karachi also reported similar findings[16]. Low socio-economic status is related to inadequate training of HCPs, lack of resources and a higher patient to HCP ratio. All these factors may hence be implicated in the higher incidence rates of NSIs.

It was found that nurses comprise the majority of NSI cases at the tertiary healthcare centers of Karachi. Similar findings were reported in contemporary studies[17,18]. The higher numbers pertain to the relative majority of nurses in strength as compared to professionals of other caders. Besides, nurses are in close contact with patients and more at risk of inflicting NSI17,18. In the current study, house officers were found to be the most at risk. In a study conducted at the Aga Khan Hospital of Karachi Pakistan, almost similar findings were observed[19]. Similar findings were also reported by studies conducted in India[14,15]. The higher frequency of NSIs among the young doctors is possibly due to the relative naiveness, lack of professional experience and overwhelming enthusiasm in comparison to the experiences HCPs of other caders[20]. Professional experience has previously been found to inversely correlate with frequency of NSIs among HCPs[16,21]. The current study also endorses this fact.

Table 1: Demographic and professional data of study respondents (n=404)

Variable	Frequency	Percentage
Age in Years		
18-24 Years	100	24.79%
25-30 Years	210	52.00%
More than 30 Years	94	23.30%
Gender		
Female	269	66.60%
Male	135	33.40%
Job category		
Consultant	36	8.91%
House O cers	77	19.05%
Nursing Sta	179	44.30%
Trainee Nurses & Midwife	70	17.32%
Others	42	10.39%
Length of service in years (Study Hospital)		
0-2 years	151	37.40%
2-4 Years	191	47.30%
4-6 Years	36	8.90%
> 06 years	26	6.40%

Table 2: Proportion of healthcare workers at-risk for NSI and frequency of NSI among study participants.

Variables (n=404)	Yes	No	Don't Know/Don't Remember
Administration of injections during work	**336 (83.17%)**	**68 (16.83%)**	-
Assistance in Removal of Needle	**358 (88.61%)**	**46 (11.39%)**	-
Recapping Needles	**357 (88.33%)**	**47 (11.67%)**	-
Sustained any NSI during last 12 months	**251 (62.10%)**	**153 (37.90%)**	**0%**
≥2 NSIs in the last 12 months	**135 (33.4%)**	**116 (28.7%)**	**153 (37.9%)**
Incident form lled	**66 (16.3%)**	**153 (37.90%)**	**185 (45.80%)**

Table 3: NSI education level and prophylactic measures among study respondents.

Variables (n=404)	Yes	No	Don't Know/ Others
Knowing Hospital policies	**28.70%**	**71.30%**	**0**
Following universal precautions (Following complete PPE)	**35.10%**	**64.90%**	**0**
Sharp box placed in clinical area	**37.10%**	**25.20%**	**37.7%**
Incident Reported to Infection Control Dept.	**15.3%**	**53.8%**	**30.9%**
Received training in the prevention and/ or treatment of needle stick injury	**29.0%**	**71%**	**0**
Read any copy of the hospital's "Health and Safety Policy", on the safe and ethical disposal of clinical wastes during the last two years	**35.1%**	**64.9%**	**0**
Hepatitis B vaccination	**75%**	**11.1%**	**13.9%**

Table 4: Frequency of NSI in the last 12 months among various caders of HCPs in context of various study parameters.

Variable	Yes %	No %	P.Value
Job category			
Consultant (n=36)	2.9%	5.5%	
House O cers (n=77)	15.3%	3.2%	
Nursing Sta (n= 179)	26.7%	15%	p < 0.001
TRNs /TRMs (n= 70)	13.6%	10.5%	
Others (n= 42)	4.2%	3.1%	
Age in Years			
18-24 Years (n=100)	10.3%	12.9%	
25-30 Years (n=210)	43.8%	8.5%	p < 0.001
More than 30 Years (n=94)	8.6%	15.9%	
Gender			
Female (n=269)	37.1%	29.0%	p < 0.001
Male (n=135)	25.6%	8.3%	
Years of experience in the industry			
0 - 2 Years (n= 151)	26.4%	10.2%	
2 - 4 Years (n=191)	25.4%	21.6%	p < 0.001
4 - 6 Years (n=36)	7.7%	1.8%	
More than 6 Years (n=26)	3.2%	3.7%	

Table 5: Knowledge and training regarding NSIs among HCPs (n=404)

Variables	Yes %	No %	Don't Know/ Others	P Value
Knowledge of lling incident form	**26.2%**	**60.7%**	**13.1%**	**p < 0.001**
A practice of reporting the injury	**73.7%**	**26.3%**	**0%**	**p < 0.001**
Training	**25.5%**	**74.5%**	**0%**	**p < 0.001**
olicies	**32.6%**	**67.4%**	**0%**	**p < 0.001**

Lack of training and unawareness about NSIs has been reported to be the most important risk factor for NSI among HCPs[22]. In the current study we also found that the HCPs lacked in appropriate training for tackling NSIs. It is hence suggested that such training sessions and seminars be regularly conducted in tertiary health care centers and a minimum level of necessary understanding of the issue be rendered mandatory.

Conclusion

It is concluded that NSIs are frequent in local HCPs of Karachi Pakistan. Young doctors are the most at risk, whereas nursing sta comprise the major bulk of affectees. Lack of awareness and immunization against HBV are issues of concern and need attention.

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Research article

To Evaluate the Changes Arise in the Parameters of Liver and Kidney during Adjuvant Chemotherapy in Breast Cancer Patients

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Abstract

To find out the variation in basic parameters of liver and kidney during FAC or CAF adjuvant chemotherapy in breast cancer patients at NIMRA jamshoro. A follow up study conducted at Nuclear, Institute of Medicine Radiotherapy (NIMRA), Jamshoro, Sindh, Pakistan. Our findings include the variations in the level of Total bilirubin, Alkaline phosphatase and Alanine transaminase as the parameters of liver. The mean ±SD of total bilirubin before FAC (5-Fluorouracil, doxorubicin and cyclophosphamide) or CAF (Cyclophosphamide, doxorubicin and 5-Fluorouracil) Adjuvant Chemotherapy in Breast Cancer Patients was 0.76±0.23 and after it was 1.23±0.16. The mean ±SD of Alkaline phosphatase before FAC or CAF Adjuvant Chemotherapy in Breast Cancer Patients was 96.2±2.89 and after it was 131±14.3 and Alanine transaminase before FAC or CAF Adjuvant Chemotherapy the mean ±SD was 25.5±6.18 and after it becomes 37.7±5.18. We found the variations in the level of urea and creatinine as the parameters of kidney. The mean ±SD of urea and creatinine before FAC or CAF Adjuvant Chemotherapy in Breast Cancer Patients was 15.4±4.98 and 0.85±0.20 and after chemotherapy they were 28.0±1.70 and 1.76±0.09 respectively. The main parameters of liver and kidney were statistical significantly increased after FAC or CAF adjuvant chemotherapy in the woman with breast cancer. These changes will alter the working of these organs by making drastic effects on the normal metabolic and excretory function of liver and kidney.

Keyword: Adjuvant chemotherapy, breast cancer, liver, kidney.

Introduction

Adjuvant systemic therapies such as endocrine therapy, anti HER2 therapy and chemotherapy are very much effective to lower the risk of recurrence both distant and local cancer. Mortality rates of breast cancer are also reduced with the use of adjuvant systemic therapy[1]. 5-fluorouracil has become the backbone drug in the chemotherapy treatment but it is involved in the development of liver injury, certain report showed that steatosis was developed after administration of 5- fluorouracil in the chemotherapy treatment although some reaction may be reversible[2]. The liver toxicity caused by chemotherapeutic agents. They stated that cyclophoshamide, 5-fluorouracil and doxorubicin may cause the liver toxicity at first after administration of these drugs and then come to the normal. Liver has their catabolism mechanism that reduces the toxicity of these drugs in the hepatic cells. Liver toxicity is rarely produced by these drugs observed by King and Perry[3]. Chemotherapeutic drugs also damage the kidney. The functional unit of kidney is nephron and its glomerulus, renal tubules, interstitium badly affected resulting in rise of concentration of serum creatinine. The nephrotoxicity primarily show no sign and symptoms and then goes to serum electrolytes imbalance. Short term side effects were nausea and vomiting as increase in urea and creatinine level in the body[4].

Materials and Methods:

This work was designed as follow up study. We have selected breast cancer patients for research who are seeking treatment at Nuclear, Institute of Medicine Radiotherapy (NIMRA), Jamshoro, Sindh, Pakistan from 1st April 2015 to 30th October 2015.

We observed 131 patients and 105 patients were agreed to participate in our research. 105 chemotherapeutic women with age range between 20 to 60 years, having breast cancer. They underwent surgery and taking adjuvant treatment with FAC or CAF chemotherapy were included. The man having breast cancer, women with age limit Less than 20 or greater than 60 years, who were not willing in participate in research were also excluded. Having any other type of cancer, non-surgical, Radio therapeutic, neoadjuvant chemotherapeutic and other chemo drugs were also excluded.

5 ml human blood sample was collected from the breast cancer women before the administration of FAC/CAF adjuvant chemotherapy and then after each cycle of FAC/CAF adjuvant chemotherapy in neutral jell tubes. The gap between each cycle of FAC/CAF adjuvant chemotherapy was 21 days. After every cycle of FAC/CAF adjuvant chemotherapy blood sample was drawn from each patient by the vacutainer needle for the quantitative analysis of total bilirubin, alkaline phosphates, alanine transaminase as the marker of liver function test and urea and creatinine as the marker of renal function test. The liver function test performed at biochemistry analyzer JH-6020 and the analysis of Urea and Creatinine from serum at Hitachi 902 automated instruments Germany Roche Company at NIMRA hospital Jamshoro. After six plus cycle of FAC/CAF adjuvant chemotherapy the values were calculated to find the mean ±SD of the parameters.

Statistical analysis

All the data was entered and analyzed on Statistical Package for Social Sciences (SPSS) version 16.0 (SPSS Inc., Chicago, Illinois, USA). Mean +SD was calculated for liver function test and renal function test of FAC/CAF adjuvant chemotherapeutic patients.

Results

Our findings include the variations in the level of Total bilirubin, Alkaline phosphatase and Alanine transaminase. The mean ±SD of total bilirubin before FAC (5-Fluorouracil, doxorubicin and cyclophosphamide) or CAF (Cyclophosphamide, doxorubicin and 5-Fluorouracil) Adjuvant Chemotherapy in Breast Cancer Patients was 0.76±0.23 and after it was 1.23±0.16. The mean ±SD of Alkaline phosphatase before FAC or CAF Adjuvant Chemotherapy in Breast Cancer Patients was 96.2±2.89 and after it was 131±14.3 and Alanine transaminase before FAC or CAF Adjuvant Chemotherapy the mean ±SD was 25.5±6.18 and after it becomes 37.7±5.18. we found the variations in the level of urea and creatinine. The mean ±SD of urea and creatinine before FAC or CAF Adjuvant Chemotherapy in Breast Cancer Patients was 15.4±4.98 and 0.85±0.20 and after chemotherapy they were28.0±1.70 and 1.76±0.09 respectively.

Table 1 Liver Function Test Before and After FAC (5-Fluorouracil, doxorubicin and cyclophosphamide) or CAF (Cyclophosphamide, doxorubicin and 5-Fluorouracil) Adjuvant Chemotherapy in Breast Cancer Patients

Parameters	Before chemotherapy Mean ± SD	After chemotherapy Mean ±SD	Minimum	Maximum	Normal ranges
Total Bilirubin (mg/dl)	0.76±0.23	1.23±0.16	1.11	1.52	0.3-1.3
Alkaline phosphotase (U/L)	96.2±2.89	131±14.3	116	159	40 -150
ALT (U/L)	25.5±6.18	37.7±5.18	31.7	44.2	0-40

Table 2 Renal Function Test Before and After FAC (5-Fluorouracil, doxorubicin and cyclophosphamide) or CAF (Cyclophosphamide, doxorubicin and 5-Fluorouracil) Adjuvant Chemotherapy in Breast Cancer Patients

Parameters	Before chemotherapy Mean ± SD	After chemotherapy Mean ±SD	Minimum	Maximum	Normal ranges
Urea (mg/dl)	15.4±4.98	28.0±1.70	25.8	31.2	6-22
Creatinine (mg/dl)	0.85±0.20	1.76±0.09	1.59	1.89	0.6-1.3

Figure 1 Liver Function Test Before and After FAC (5-Fluorouracil, doxorubicin and cyclophosphamide) or CAF (Cyclophosphamide, doxorubicin and 5-Fluorouracil) Adjuvant Chemotherapy in Breast Cancer Patients

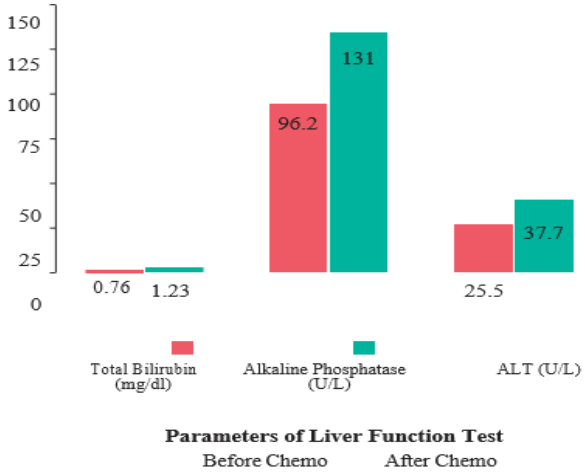
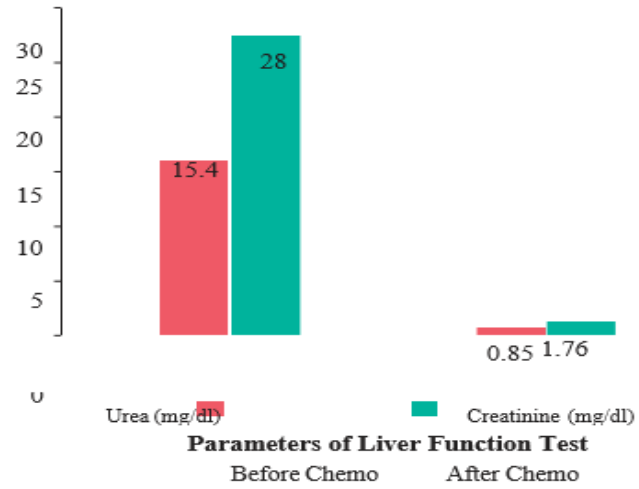


Figure 2 Renal Function Test Before and After FAC (5-Fluorouracil, doxorubicin and cyclophosphamide) or CAF (Cyclophosphamide, doxorubicin and 5-Fluorouracil) Adjuvant Chemotherapy in Breast Cancer Patients



Discussion

Liver is the metabolic center of the body. It plays a major role in detoxication. The metabolites of drugs and toxicities that are produced by the administration of drugs will cause the hepatoxicity. There are statistically significant results reported regarding level of Total Bilirubin, Alkaline phosphatase and Alanine transaminase in liver function test before and after the cycles of CAF or FAC adjuvant chemotherapy as shown in the Table 1. The normal levels of the parameters of liver were increased at the end six plus cycle of FAC/CAF adjuvant chemotherapy. King and Perry 2001 also discussed that the doxorubicin with cyclophosphamide and 5 – flurouracil in adjuvant setting developed liver abnormalities within the first three months and these elevated levels were normalized with the passage of time[3]. Rise in the levels of alkaline phosphatase with alanine transaminases and total bilirubin initially caused the hepatotoxicity but will be normalized after the completion of treatment.

Kidney is the major excretory organ of the body that is chiefly performed the removal of nitrogenous waste from the blood and filter the blood. The elevated level of nitrogenous waste will affect the blood physiology and cause imbalance in the normal plasma concentration of the blood. During the study urea and creatinine levels were increased after CAF or FAC administration and statistically significant before and after the cycles of chemotherapy as appeared in the Table 2. Before administration of FAC/CAF adjuvant chemotherapy the mean ±SD of urea was 15.4 ±4.9 and creatinine was 0.85 ±0.20. After six plus cycles FAC/CAF adjuvant chemotherapy the mean ±SD of urea was 28±1.70 and creatinine was 1.76±0.09. this increased level of urea and creatinine will damage the nephron, glomerulus and put drastic effect of function of kidney. Warmkessel 2011 reported that alkylating agent cyclophosphamide caused nephrotoxicity include increases urea and creatinine level in the blood. Urea and creatinine was metabolic waste product of nausea and vomiting that accumulate in blood[4]. These elevated levels caused the asymptomatic renal disorders[7,8].

Conclusion

The main parameters of liver and kidney were statistically significantly increased after the adjuvant chemotherapy in woman with breast cancer. They may put drastic effects on the normal metabolic and excretory function on both the organs. The patients should be warned regarding the drastic changes and must be known that how to face and recover from the changes occurring during and after FAC/CAF adjuvant chemotherapy.

Ethical considerations

The research proposal was approved by research ethics Committee Institute of Biochemistry University of Sindh Jamshoro

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Research article

Ultrasound Imaging in Settings of a Natural Disaster: Experience from October 8th 2015 Earthquake in Pakistan

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Abstract

Ultrasound (U/S) imaging has a broad spectrum of applications in medical practice. The earthquake of October 8, 2005 was one of the most severe in the history of Pakistan, claiming around 80,000 lives in the region of Azad Kashmir. U/S imaging was the only diagnostic radiological investigation available in the region. The study was aimed to evaluate the role of U/S in diagnosing internal injuries among victims of the earthquake. All the patients referred for U/S imaging at Abbas Institute of Medical Sciences (AIMS)were accordingly examined and the data was recorded on a proforma. The procedures included examination of chest, abdomen, pelvis, extremities and fetal wellbeing (FWB). U/S findings were correlated with clinical, laboratory or surgical exploratory findings. A total of 87 patients, 22 males and 65 females, were examined. Definitive diagnoses were established in 16.8% of abdominal examination cases, 76.6% of abdomen/pelvis examinations and 78.6% of Gynae & Obstetric examination cases. The course of management was changed completely using U/S observations in 36% of the cases of chest examinations, 71.9% of the cases of abdominal & pelvic examination and 75.8% of the cases of Gynae & Obstetrics. It was concluded that U/S is a useful diagnostic modality in the settings of a natural disaster. Head and spine injuries, however, cannot be assessed with this diagnostic modality and needs special consideration.

Keywords: Ultrasound, Kashmir, earthquake disaster

Introduction

Ultrasound (U/S) imaging has a broad spectrum of applications in medical practice. It is a non-invasive technique used to assess internal body structures/organs. The findings are often definitive and have pivotal role in disease management. Of particular importance is the use assessment of pregnancy. Ultrasound works on waves generated by piezoelectric transducer at frequencies that are in-audible to humans (i.e. >20,000 Hz)[1].

On October 8, 2005, a series of earthquakes measuring a maximum of 7.6 on the Richter scale struck Kashmir and other Northern areas of Pakistan. The epicenter was about 19 kilometers northeast of Muzaffarabad (the capital of Pakistan administered Kashmir), and 100 kilometers north-northeast of Islamabad, Pakistan. The catastrophe resulted in widespread damage, wiping out entire villages and flattening towns and cities. It was the most severe disaster in the history of Pakistan, claiming around 80,000 lives and severely injuring another 80,000. Most hospitals were destroyed and limited medical facilities were available in the immediate aftermath. Building collapse was associated with widespread crush injuries[2-5]. From a practical point of view, all the radiological instruments, along with others, were out of order for several weeks.

A group of volunteers from Jinnah Postgraduate Medical Centre (JPMC), the National Institute of Child Health (NICH) and the National Institute of Cardiovascular Diseases (NICVD) comprised of 20 members, including: four orthopedic surgeons, 02 thoracic surgeons, 01 cardiac surgeon, 01 radiologist, 02 postgraduate trainees and 10 paramedics. Our team reached Mansehra on the 2nd day of the disaster. The roads were blocked due to land sliding. There was no electric supply in Muzaarabad. We settled in the Abbas Institute of Medical Sciences (AIMS). It took more than two days to establish generator based electric supply. The 600 mAs X–ray machine of AIMS could not be operated by the generator based electric supply.

The only Radiologist/Sonologist in the city of Muzaffarabad & its surroundings was from the team mentioned above. The radiologist was equipped with a portable U/S machine (Facuda®) and performed sonography of all body regions.

All the radiological modalities, along with others, were out of order, the role of portable U/S was assessed in injured earthquake victims to confirm or change the clinical diagnosis.

The current study shares experience of this group regarding utility of ultrasound imaging in settings of a natural disaster as the only radiological investigation modality.

Methods

All the patients who were referred to AIMS for ultrasonographic assessment were enrolled into the study. Data was recorded on a proforma excluding patients who could not be followed. Examinations included that of chest, abdomen, pelvis, fetal well-being (FWB) and extremities. Examination of the chest and abdomen were considered as separate entities. U/S findings were compared with clinical, laboratory and/or surgical exploratory findings.

The cases diagnosed as hemothorax (with supportive history based evidence) on U/S were also measured for depth; if less than 4.0 cm, a diagnostic tap was performed. In those with >4.0-cm deep hemothorax, an urgent tube thoracostomy was performed by a thoracic surgeon. Cases of hemopneumothorax, hemothorax, pneumothorax and subcutaneous/surgical emphysema were also confirmed by diagnostic tap, tube thoracostomy and/or X-raychest.

Results

Thirty two patients were evaluated for abdomen and/or pelvic diseases, of which 14 were males and 18 were females. A total of 25 cases were sent for chest examination. The U/S findings in these cases are listed in Table 1. Two of the patients having spinal trauma and distended Urinary Bladder (UB) were diagnosed as having large fibroids by the gynecologist and general surgeon. U/S confirmed that it was simply a distended UB on both occasions; after catheterization 900 ml & 700 ml of urine was collected respectively and the distension disappeared. UB rupture cases were diagnosed and confirmed as mentioned above. Pseudokidney sign was observed in three patients, two females and a male; all three were found to have colonic pathology. In pseudokidney sign, the diseased large gut, in some situations, give appearance similar to that of kidneys on U/S examination. In cases of peritonitis due to perforation of gut, fluid collection in the abdomen was confirmed on diagnostic tap and then laparotomy. In case of pneumoperitoneum, free gases with posterior acoustic shadowing were noted deep to the anterior abdominal wall. In case of paralytic ileus, no bowel movement was noted on U/S. Cases of renal & gall bladder calculi did not need further confirmation. Worm infestation of the small intestine was found in two children. A case of large renal cortical cyst measuring 50 ml was also found and dealt with accordingly. In total, 35 cases were referred for abdomino-pelvic examinations. their description is provided in Table 2.

The total number of patients evaluated for FWB and Gynae/Obs was 29. Most of the pregnancies were in range of 3 to 4½ months of gestation. These were suspected to have Intra-uterine deaths (IUDs) and/or placental hemorrhage and were referred accordingly. Among these cases, three IUDs and two complete abortions were confirmed on U/S. One suspected case of early pregnancy revealed no sonological signs of conception i.e. Decidual reaction etc. and was confirmed on pregnancy test. The findings and confirmative tests are presented in Table 3.

One male patient was evaluated for deep venous thrombosis (DVT) on U/S lower limb. A clot popliteal vein was observed in this case. Blood flow pattern could not be detected as we had Gray scale U/S machine.

The management was changed completely using U/S observations in 36% of the cases of chest examinations, 71.9% of the cases of abdominal & pelvic examination and 75.8% of the cases of Gynae & Obstetrics. On cumulative scale the management was altered in 52 (62%) out 87 cases based on U/S findings. Confirmatory tests were performed in 49 cases which were in concordance with U/S findings.

Discussion

In the current study we found ultrasound to be of significant diagnostic value in the settings of natural catastrophe. Among the major challenges faced was inadequate experience with disaster medicine. The psychological consequences seem to be long-lasting especially for those who have survived with elevated degree of exposure to trauma[6]. Agility and pro-activeness is expected from field hospitals in their mode of functioning[7].In the current study we found ultrasound to be of significant diagnostic value in the settings of natural catastrophe. Among the major challenges faced was inadequate experience with disaster medicine. The psychological consequences seem to be long-lasting especially for those who have survived with elevated degree of exposure to trauma[6]. Agility and pro- activeness is expected from field hospitals in their mode of functioning[7].

Table 1. Findings on U/S Chest

	No. of pts	%
Unilateral pneumothorax	1	4
Unilateral mild hemothorax	3	12
Unilateral moderate hemothorax	3	12
Bilateral moderate hemothorax	1	4
Unilateral hemopneumothorax	4	16
Bilateral hemopneumothorax	2	8
Consolidation	4	16
Diaphragmatic injury	1	4
Surgical/sub-cutaneous emphysema	2	8
Normal U/S chest	4	16
Total	**25**	**100**

Table 2. Findings on U/S Abdomen

	No. of pts	%
Distended Urinary bladder	3	8.5
Urinary bladder rupture	2	5.7
Peritonitis due to perforation of gut	2	5.7
Blood clot in urinary bladder	2	5.7
Growth in colon	2	5.7
Gut distended with gasses	1	2.8
Absent bowel movements (paralytic ileus)	1	2.8
Pneumoperitoneum	1	2.8
Cholelithiasis	1	2.8
Enlarged prostate	2	5.7
Worms in small intestine	2	5.7
Renal calculi	2	5.7
Large renal cortical cyst	2	5.7
Cystitis	1	2.8
Polycystic kidneys disease	1	2.8
Normal U/S abdomen	10	28.5
Total	**35**	**100**

Table 3. Confirmatory Tests for U/S findings

	No. of pts	%
X - ray chest	14	28.6
Diagnostic tap	8	16.3
Tube thoracostomy unilateral	8	16.3
Foley's catheterization	7	14.3
Tube thoracostomy bilateral	2	4.1
Evacuation	3	6.1
Laparotomy	2	4.1
Flatus tube	1	2.0
Recommendations for colonoscopy & biopsy †	2	4.1
Pregnancy test	1	2.0
Urine D/R	1	2.0
Total	**49**	**100**

† The facility was not available there, on that occasion

D/R, detailed report

When kinetic energy transfers to human body it frequently results in blunt trauma to chest. This may inflict severe injuries including thoracic skeleton fractures, pleural space disintegration, pulmonary parenchymal laceration and mediastinal structural damage. An organ-based assessment for thoracic trauma can be followed as a systematic approach. Conventional radiography primarily helps in diagnosing thoracic trauma, accompanied by ultrasonic checkup of abdomen and pleura (EFAST & FAST) one after another.

It has been established that CT scan serves as vital innovation for evaluation of thoracic trauma. Time consuming procedures in critically traumatized patients are being replaced potentially by fast helical CT scanning. It is helpful to spot intraperitoneal fluid and free air, detect the level of solid organ injury, spot injuries of retroperitoneal and often useful in deciding for conventional treatment. The time of patient to stay in CT scan room is reduced by rapidly performing helical CT. Additionally; coronal and sagittal reconstruction images have been improved over the years; help is hence attained in spotting ruptured diaphragm[8-12]. Nonetheless, importance of U/S imaging in the absence/unavailability of CT scan is of prime consideration[13]. Same was the case observed in our situation in Kashmir, Muzaffarabad where all other service related to radiological modality was found. Extended focused assessment with sonography for trauma(EFAST) has comparable utility as that of chest X-ray (CXR); the specificity of U/S rather exceeds in cases of occult pneumothoraces (OPTXs)[14,15]. A previous study found U/S to be comparable with CT scanning in assessment of OPTXs[16]. Similarly sonographic findings are more accurate in diagnosis of fractures as compare to radiography[17].

Despite advances in trauma care, significant morbidity and mortality exists which could be minimized provided all the injuries are immediately identified. Mass disasters compound this challenge further due to delayed referral. Two treatable factors are hypoxia and hypovolemia which may occur secondary to haemorrhage into the chest and abdomen. Pneumothorax is also a frequent cause of preventable trauma death. Clinical examination is often limited and attending physicians/surgeons often rely on radiological imaging[18-21]. In the current study, U/S findings significantly altered the course of management in cases with pneumothorax. Besides diagnosis, U/S can be of great utility in therapeutic interventions in such cases. An ultrasound-guided thoracentesis not only facilitates the procedure but improves its safety[22].

Feussner H & co-workers stated that lethality and morbidity of blunt abdominal trauma are directly dependent on the immediately valid diagnostic work-up. Since blunt abdominal trauma usually occurs in the setting of multisystem injury and patients are no longer cooperative, clinical methods of diagnosis are unreliable. Since the facilities to perform ultrasound are provided in all emergency units and knowledge of ultrasonography is an essential part of surgical training, contemporary diagnostic procedures like peritoneal lavage have almost completely lost their former important clinical role. Similarly, diagnostic laparoscopy is, in contrast to abdominal perforations, no longer of importance[23]. Griffin XL and co-worker found peritoneal lavage as a safe diagnostic strategy[24]. We, hoever, did not perform any peritoneal lavage because the sensitivity and specificity of ultrasonography in detection of free intraperitoneal fluid is over 90%[25]. In our case, the detection rate was 100%.

U/S is easy and quick to perform, it permits an accurate diagnosis with a low ratio of error. Particularly, it gives the chance to operate in emergency patients with steady haemodynamic conditions and to follow up those with partial parenchymal lesions, monitoring the clinical status in order to properly choose between conservative treatment and delayed surgery. Hence, unnecessary laparotomies are now uncommon, and a wide array of interventional radiological techniques can be used to treat abdominal emergencies without surgery[26-29]. A major drawback of ultrasound is itsoperator dependency, but when applied by a proficient examiner using a goal-directed, time sensitive protocol, does not delay patient management and provides diagnostic and therapeutic benefit[30]. In addition, a study performed by Abu- Zidan FM and co-workers at University hospital, Kuwait, showed that the sensitivity was lesser in the hands of the surgeon than the radiologist (67% compared with 90%)[31].

Conclusion

We concluded that U/S imaging in establishing diagnosis has a pivotal importance in settings of natural disasters. U/S served useful information in cases of abdomen, pelvis, gynecological/obstetric and thoracic trauma. The diagnostic modality, however, did not prove to be of significant help in those with Head & Spinal injuries.

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Conflict of Interest

We hereby declare that we do not have any conflict of interest related to publication of this article.

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None

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Research article

The Efficacy of Hands on Workshop on Infection Control to Healthcare Professionals: An Intervention Study

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Abstract

Strict compliance with basic infection control practices such as standard precautions is a simplest way of controlling spread of hospital acquired infections. A one day hands on infection control workshop was conducted at National Institute of Blood Diseases in April 2017. The nursing staff (NS; n=51) and allied healthcare professionals (AHCP; n= 24) at the institute were requested to participate in this study. The participants were informed verbally and asked to fill out a short questionnaire right before starting and at the end of the workshop to evaluate their knowledge and performance/attitude towards general infection control practices. The response rate, mean and standard deviation of each test score were determined using SPSS version 23. There was a significant difference between the pre-workshop and post-workshop test scores for nurses ($p<0.001$).The score for AHCP was comparatively better than the nurses in pre-workshop test with an average of 11.25±1.11. Although the result for the AHCP improved in post-workshop but difference between the mean scores was statistically insignificant ($p=1$). Gaps in knowledge and attitude/ performance were observed based on percentage of right answers in both categories but a significant difference $p=0.0042$ was observed in performance and attitude category in post workshop test scores. It can be concluded that educational session along with hands on workshops can be a significant tool in building a culture of safety environment in a hospital.

KEYWORDS: Infection, Nursing Staff, Healthcare Professionals, Performance/Attitude, Workshops, Hospital.

Introduction

Hospital acquired infections (HAIs) have been reported as one of the cause of adverse outcomes in most disease conditions. The HAIs are the major cause of prolonged hospitalization, increased hospitalization cost and even mortality. Patients particularly suffering from hematological malignancies or aplastic anemia etc often receive chemotherapy with bone/stem cell transplant as part of treatment regimen. These immuno-compromised patients are generally placed in isolations with controlled air pressures and designated staff to avoid HAIs. Despite strict regulations patients acquire HAIs even in these wards as reported in other studies[1-4]. As an infection control initiative, blood and body fluids from any patients should be considered as potentially infective material thus standard precautions should be taken to avoid spread of infection at any possible instance. Compliance with standard precautions plays an important role in preventing HAIs in these isolation wards[6,7]. Standard precautions include considering strict hand hygiene compliance, proper use of personal protective equipments (PPE), safe injection practices, infection control measures during lumbar puncture procedures, cough etiquette, proper waste management and disposal[10]. WHO recommends training of staff regarding standard precautions with special emphasis on hand hygiene[12]. Hands are the commonest vehicle for transmission of infections in closed isolation settings. Literature supports the efficacy of education and hands on trainings in improving the overall rate of infections in different healthcare facilities worldwide.

The main purpose of this study was to determine the level of knowledge of standard precautions/infection control practices as well as to determine performance/attitude towards these.

Material And Methods:

National Institute of Blood Disease & Bone Marrow Transplantation (NIBD), Karachi, Pakistan is a teaching general hospital which provides medical care for patients. This interventional study was performed during and at the end of a hands on workshop on infection control held at NIBD in April 2017. About 73 health care professionals participated in the workshop altogether. The participants were broadly divided into two categories

i.e. nursing staff (NS=51) and allied health care professionals (AHCP=24). The NS included 9 registered nurses, 23 certi ed nurses and 19 nursing assistants while AHCP included 11 doctors, 6 pharmacists, 4 laboratory technologists, 2 faculty members and 1 administrative officer respectively. Ethical approval was taken from the institutional ethical committee prior to workshop while verbal consent to fill out a self-reported questionnaire was taken from the participants at the beginning of the workshop (Table-1).

The questionnaire was specially designed containing 14 questions altogether to cover areas of knowledge and performance/attitude towards standard infection control practices with equal distribution of questions i.e. 7 for each category. The participants filled out these 14 questions questionnaire at the beginning and end of the workshop. The answers were marked as "right", "wrong" or "no answer". The response rate, mean and standard deviation of each test score were determined using SPSS version 21. The significant difference between the two tests were calculated by Students t-test. The level of significance was set at 5% for all observations.

Results

The rate of response to questionnaire was good i.e. 93.33% (70/75). There was a significant difference between the pre-workshop and post-workshop test scores for nurses($p=0.0058$; Table-2). The score for AHCP was comparatively better (11.25 ± 1.11) than the nurses (9.81 ± 2.34) in pre-test (Table -2) Although the score for the AHCP improved in post test (12.1 ± 0.85) but difference between the mean scores was statistically insignificant ($p=1$). Gaps in knowledge and attitude/ performance were observed based on percentage of correct responses to questions in both categories. Frequency of right response to questions in pre-workshop and post-workshop test was lower in attitude/ performance category in both groups. A significant difference $p=0.0042$ was observed in performance and attitude category in cumulative post workshop test scores of all participants (Figure-1).

Table 1: Knowledge and performance/ attitude questions

Knowledge Questions	Performance and attitude questions
1. Standard precautions are precautions taken to reduce the transmission of infections	1. PPE like gloves and gowns should not be worn in corridors, staff room, office or linen room etc.
2. The hand washing is an effective substitute for use of gloves	2. Masks and goggles must be worn for care activities such as care of patients who have a cough.
3.The objective of standard precautions is infection prevention inside a hospital	3. Hands must always be washed after removing gloves.
4. The use of personal protective equipments along with hand washing is effective in infection control.	4. In a hospital, standard precautions are the responsibility of nurses and doctors only.
5. Microorganisms can spread through food, drinks, water and fomites etc	5.Effective hand washing should be performed for 30-40 seconds with use of friction to clean between fingers, palms, nail beds, back of hands and wrists
6. Hands cannot be cleaned with alcohol-based hand gel if visibly dirty.	6. You should wash your hands before/after: preparing food, taking off gloves, entering into a patient's room.
7. All the hospital staff is responsible for cleanliness within the hospital to control spread of infection.	7. No objects like rings, watches nail art etc are allowed when you are bare below the elbows.

Table2: Test scored of workshop participants

Workshop Participants	Pre-workshop test Mean Score±SD	Post-workshop test Mean Score±SD	p-value
NS	9.07±2.35	11.41±1.57	0.0058
AHCP	11.25±1.11	12.1±0.85	1.00
NS=nursing staff; AHCP= allied healthcare professionals			

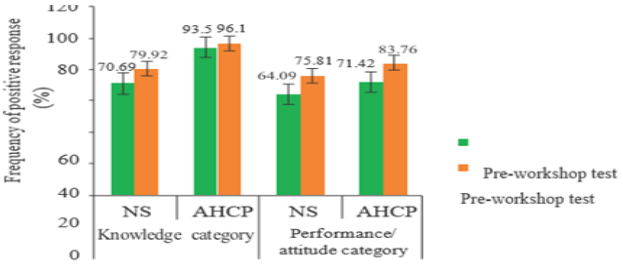

Figure 1: Frequency of positive response to the knowledge category and performance/attitude category of questions in pre-workshop and post-workshop tests by nursing staff (NS) and allied health care professionals (AHCP).

Discussion

There are multiple factors which contribute significantly to occurrence and persistence of HAIs in healthcare facilities[7]. The nurses and patients are the highly susceptible group to HAIs due to continued risk of exposure to pathogen[9]. Non compliance of healthcare workers with good infection control practices or basic standard precautions is the commonest factor[2,3,6]. The reported reasons for non compliance byhealthcare workers are: over-occupied staff with multiple responsibilities expressing shortage of time, natural skin irritation due to rubber or latex in PPE, absentmindedness due to lack of training and knowledge. In a recent study Vincent et al., suggested that training regarding standard precautions particularly of hand hygiene during and after patient care may reduce HAIs[11]. The rate of hand hygiene isestimated to be less than 50% in most studies[3,4]. Brevidelli and colleagues quoted a 38.5% global compliance rate for standard precautions owing greatly to personal and organizational factors[5]. Educational workshops and availability of required resources like availability of hand rubs, soap and paper towel etc. have been a proven source of betterment in the compliance rate as reported in earlier studies[4,5]. During the present study the observed rate ofpositive response to performance and attitude category questions was lower than the knowledge category (Figure 1).In a qualitative study with a focus group Efstathiou et al noticed low or nonexistent adherence to standard precautions despite prior knowledge by the nursing staff [6].

There was a significant difference (p=0.0058) in response to knowledge and performance /attitude category right after the workshop among NS (Table-2). Adly et al also observed a significant difference in knowledge of aims and indications of standard precautions among nurses with a response rate of 91.7% and 63.3% immediately after the interventional training compared to 83.3% and 38.3% at three months follow up[1]. It was interesting to note that the mean score for the registered nurses in pre-workshop and post-workshop tests was 8.75±1.83 and 11.37±0.51 (p=0.0016) while doctors had a mean score of 10.90±1.30 and 12.09±0.94 (p=0.024) respectively. These results are in contrary to other studies where compliance was higher in nurses compared to doctors[4,9]. Difference in the two tests scores indicates that the educational session with hands on workshop had a positive impact on the overall knowledge and attitude towards standard infection control practices. Continued educational and training modules are desirable. Such sessions will have positive impact on the goal of satisfactory implementation of good infection control practices at NIBD. Furthermore, planned and structured training cum teaching models should be followed to achieve this goal.

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