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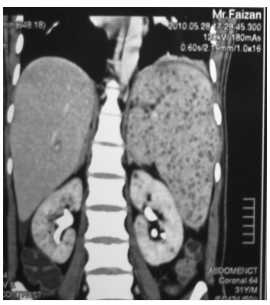

Tomogram of upper abdomen showing multiple small lesions in liver and spleen due to disseminated *Candida glabrata* **infection.**

Courtesy: Department of Microbiology, AFIP, Rawalpindi.

GUEST EDITORIAL

Antibiotics changed the world of infections. Since their discovery almost eight decades ago, they have revolutionized the treatment of infections, transforming once deadly diseases into manageable health problems. The growing phenomenon of bacterial resistance, caused by the use and abuse of antibiotics and the simultaneous decline in research and development of new medicines, is now threatening to take us back to a pre-antibiotic era.

The emergence of antibiotic resistance is further complicated by the fact that bacteria and their resistance genes are traveling faster and further. We are facing not only epidemics but pandemics of antibiotic resistance. Airlines carry billion of passengers annually, vastly increasing the opportunities for rapid spread of infectious agents, including antibiotic resistant bacteria globally. The spread of resistance is also facilitated by worldwide distribution of food. Another important factor is poor hygiene in hospitals as well as in the community, promoting the rapid spread of antibiotic resistant bacteria among populations.

Besides, other contributing factors which play role in spread of infectious diseases in our country include mass migration, breakdown of medical infrastructure during floods and earthquake, large scale urbanization with little planning, poor sewage system and over the counter sale of antibiotics. The emergence of multi-drug resistant TB is a growing concern. There were 7700 dengue positive cases and 111 related deaths till 2010.

To address such challenging tasks, IDSP took the initiatives. The society, primarily works on the prevention of infectious diseases by raising awareness, provide guidelines and teaching and training on various aspects of infectious diseases. Multiple workshops on infection control are held in various cities for doctors and nurses. Guidelines on use of antibiotics and management of rabies are in circulation and freely available. The growing number of active members and affiliation with national and international societies is an encouraging sign. IDSP is the strategic partner for Safeguard for the school education program. Objective of Safeguard School Program is to drive hand-washing awareness and bring about habit change at grass-root level, becoming ally to mothers by empowering kids with health and hygiene education. IDSP successfully attained 1.6 million kids across 5,021 schools in Pakistan.

To address the need of postgraduate doctors in infectious diseases the society succeeded in getting approval of FCPS (fellowship) in infectious diseases from CPSP. There are now five fellows under training at various prestigious institutes of Pakistan. The research medical journal on infectious diseases is now recognised by HEC, CPSP and PMDC.

During last four years as President IDSP, we have shown utmost devotion to these issues. There is still lot more to do which is possible only by public/private partnership program. IDSP has always been in the forefront to assist all those interested in prevention and control of infectious diseases in Pakistan.

Dr. Altaf Ahmed
Past President, IDSP
2008-2011

Clinical Course and Presentation of Critically Ill Children with 2009 H1N1 Influenza A Infection

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Abstract

Background
We reviewed cases of 2009 H1N1 infection in children < 21 years of age admitted to the Pediatric Intensive Care Unit (PICU) from April to December 2009 in northeast Florida.

Results
Of the 25 H1N1 infected patients admitted to the PICU, 13 (52%) were male; 12 (48%) African-American and 10 (40%) Caucasian. Mean age was 7.64 years and 9 (36%) patients were < 5 years old. The mean length of stay (LOS) in the hospital was 10.04 days and mean Pediatric Intensive Care Unit LOS was 5.8 days. Twenty-three patients (92%) had at least one high-risk medical condition, pulmonary disease being the most common. Twenty-three patients had respiratory distress and 3 needed extracorporeal membrane oxygenation. Two patients had co-infections on admission while one patient had microbiologically-proven secondary infection. All patients were treated with antivirals and the mean time to the initiation of treatment from onset of symptoms was 3.4 days. One patient expired.

Conclusions
Respiratory distress was the most common presentation. Most patients admitted to the PICU had underlying medical conditions, asthma being the most common. Secondary infections were uncommon (12%) and mortality was low (4%).

Keywords
H1N1, Influenza, Pandemic Flu

Background
The 2009 H1N1 influenza A (H1N1) virus first identified in the United States in April of 2009, impacted children and adolescents more than the general population.[1] The severity of the illness varied, with most children presenting only with upper respiratory tract infection while others had severe illness resulting in death.[1-3] Compared to the previous flu season, twice as much deaths were associated with H1N1 infection.[4]

We report our experience with H1N1 infection at Wolfson Children's Hospital (WCH), the only regional Children's Hospital in northeast Florida. The objective of this review was to describe the demographics, clinical course, management and complications of critically ill patients with H1N1 infection admitted to the Pediatric Intensive Care Unit (PICU). The Institutional Review Boards of both University of Florida and WCH approved the study.

Materials and methods
We reviewed retrospectively the medical records of patients admitted to WCH with H1N1 infection. WCH has 192 beds and has between 8000 to 9000 annual admissions and a catchment area of three million. The PICU at WCH is a 20 bed unit and serves >1200 children annually. The study period was between April 1, 2009 and December 31, 2009. Patients < 21 years of age with H1N1 infection were identified by review of the records of the Virology Laboratory and the Infection Prevention and Hospital Epidemiology Department which uses TheraDoc tracking system (TheraDoc, Inc., Salt Lake City, UT).

Nasopharyngeal wash specimens from patients suspected of influenza A infection were used to test for influenza A and B viral infection. Initially the laboratory was using BinaxNOW® Influenza A & B (Inverness Medical, Waltham, MA) for rapid influenza testing. However, early on in the H1N1 outbreak (on July 22, 2009), we realized the high false positive rate (42%, data not shown and no reflex test was done on antigen negative specimen) in our laboratory. We therefore switched to real time multiplex reverse transcription polymerase chain reaction (RT-PCR) assay for testing for influenza A and B infection using ProFlu+ (Prodesse Inc., Waukesha, WI). After it was established that H1N1 was the influenza A strain predominantly circulating in the community, further routine confirmation through Florida Department of Health using Centers for Disease Control and Prevention (CDC) protocol was not done except in some patients

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in the intensive care units at the discretion of the physician caring for the concerned patient. Therefore, in this study, patients with influenza A infection detected by viral culture and/or RT-PCR were categorized as either "confirmed H1N1 infection" if they had subsequent confirmatory testing using CDC protocol or "presumed H1N1 infection" if without CDC testing. Patients who had positive rapid influenza test but were not confirmed as influenza A with PCR, viral culture or CDC protocol were not included in this report.

Medical records of all patients with H1N1 infection (confirmed and presumed) in the PICU were reviewed and information was collected on a standardized data collection form. Information collected included demographics, presenting and past medical history (including chronic underlying health conditions), vital signs, laboratory and radiographic data, hospital course (including length of PICU stay), complications, management (including use of antiviral) and outcome. Length of stay (LOS) was calculated by determining the difference between hospital admission and discharge dates. Any patient who spent any time in the PICU was considered in the PICU group for the purpose of analyses. Body mass index (BMI) were determined for each patient with a cut off of BMI > 95 percentile for obese.

Statistical analyses were done, comparing confirmed with presumed cases of H1N1 infection, using two sample t-test (e.g., LOS in hospital and PICU) and Poisson regression (e.g., complication rates and treatment days from onset). The significance of covariates was assessed using ANCOVA.

Results

Of the 308 patients < 21 years of age who had confirmed and presumed H1N1 influenza, 119 were admitted to WCH and 13 to adult hospitals. Three patients were transferred to the PICU after 1, 3 and 4 days in the general medical ward. Twenty-two patients were admitted directly to the PICU. These 22 and the three that were transferred to the PICU from the general medical ward were included in the PICU group for analyses. The first H1N1 case, an outpatient, and confirmed by CDC protocol was on April 30, 2009. The first hospitalization and admission to the PICU was in June 2010. Admission to the PICU peaked in October 2009.

Of the 25 patients admitted to PICU, 12 (48%) were confirmed H1N1 infection, 13 (52%) were male and 12 (48%) were African-American and 10 (40%) were Caucasian. Mean age was 7.64 years and 9 (36%) patients were < 5 years old. The mean LOS in the hospital was 10.04 days and mean PICU LOS was 5.8 days. Twenty three (92%) patients had at least one high-risk underlying chronic medical condition (CMC), with pulmonary disease (particularly, asthma) as the most common present in 16 (69.6%) patients. Complications varied, with respiratory dysfunction being the most common (Table 1). On average, patients were admitted within 2.4 days of onset of symptoms. All but one patient had fever. Twenty-three (92%) patients had respiratory distress and 13 (52%) required mechanical ventilation of whom three needed extra corporeal membrane oxygenation (ECMO), one inhaled nitric oxide and one high-frequency oscillatory ventilation. All three patients who were on ECMO had hypertension necessitating medical intervention.

At presentation, 24 patients had chest radiographs performed and 7 (28%) had either a normal chest radiograph or no acute findings. The characteristics of the 17 (72%) with abnormal chest radiographs are listed in Table 2.

Fourteen (56%) patients were tested for Respiratory Syncytial Virus (RSV) by PCR at admission with one positive. All patients were tested for Influenza B; and none were positive. All 25 patients were treated with antivirals and the mean time to the initiation of treatment from onset of symptoms was 3.4 days (range 2-10, median 3). In 11 patients treatment was initiated within 48 hours of onset of symptoms. For two 2 patients duration of symptom onset was not recorded in the medical record. Twenty-four patients were treated for 5 days with Oseltamivir alone and one patient received Oseltamivir for 10 days, Rimantadine for 3 days and Zanamivir for one day. No antiviral treatment was given for the RSV co-infection.

Twenty three patients received antimicrobial therapy during their hospitalization. Most antibimicrobials were given empirically and were discontinued after blood, urine and/or tracheal aspirate cultures were reported. Eighteen (72%) patients had blood culture done on admission and one grew *Enterococcus faecalis*. All 12 confirmed H1N1 infected patients received one or more antimicrobials during hospitalization. Vancomycin was given to the patient who was noted to have *Enterococcus faecalis* bacteremia, while several courses of antimicrobials were given to one patient who had multiple confirmed nosocomial (secondary) infections including *Candida albicans* urosepsis and *Staphylococcus epidermidis* sepsis. Among the 13 patients with presumed H1N1 infection, 11 were treated with antimicrobials; three of them were treated with 10-14 day course of antibiotics for presumed secondary bacterial pneumonia. A patient with a complicated single ventricle congenital heart disease expired.

Shown in table 1 is the comparison between confirmed cases and presumed cases of H1N1 infection. Only LOS was statistically lower for presumed cases when compared to confirmed cases. The total hospital LOS ($t = 3.26$, $p = 0.007$) and PICU LOS ($t = 2.60$, $p = 0.022$), was on average 11.6 and 6.1 days longer for confirmed compared to presumed cases. However, when the rate at which complications occurred for confirmed versus presumed cases was compared using Poisson

Table 1 : H1N1 patients, Confirmed and Presumed H1N1 cases*

	PICU (n = 25)	CONFIRMED (n = 12)	PRESUMED (n = 13)	Confirmed vs Presumed
Age, Mean (years)	7.6 (R 0.5-20, med 8)	8.6 (R 0.5-20, med 7)	6.7 (R 0.75-12, med 8)	p = 0.427
Sex M:F ratio	13:12	7:5	6:7	p = 0.543
Race AA: White: Others	12:10:3	5:4:3	7:6:0	
LOS, Mean (days)				
• Hospital	10 (R 2-42, med 5)	16.1 (R 4-42, med 14)	4.5 (R 2-14, med 4)	p = 0.007
• PICU	5.8 (R 1-24, med 4)	8.9 (R 3-24, med 4.5)	2.8 (R 1-10, med 2)	p = 0.022
Chronic Medical Condition	46 (1.8/patient)	26 (2.2/patient)	20 (1.5/patient)	p = 0.250
• Pulmonary condition	16	8	8	
• Metabolic condition	9	5	4	
• Neurodevelopment	8	6	2	
• Obesity	5	3	2	
• Cardiac disease	3	1	2	
• Immunosuppression	3	2	1	
• Sickle cell disease	2	1	1	
Complications	31 (1.2/patient)	20 (1.7/patient)	11 (0.8/patient)	p = 0.071
• Respiratory distress	23	12	11	
• Renal failure	1	1	0	
• Hepatitis	3	3	0	
• Coagulopathy	2	2	0	
• Seizure	2	2	0	
Treatment, Mean (days from onset)	3.4 (n= 23, R 2-10, med 3)	2.7 (n = 10, R 2-5, med 2)	4 (n = 13, R 2-10, med 3)	p = 0.098
Recovered:Expired	24:1	11:1	13:0	p = 0.48

*n = number of patients, R = range, med = median

regression, there were 1.67 (20/12) complications per patient for the confirmed cases and 0.84 (11/13) complications per patient for the presumed cases (p = 0.071). The incidence density ratio of 1.97 (1.67/0.84) is suggestive that the confirmed cases had a higher complication rate (95% CI: 0.94, 4.10). However, the small sample size was insufficient to achieve statistical significance at the 5% level even though the observed rate of complications was 1.97 times higher for the confirmed group (Table 1).

Discussion

As expected in the 2009 H1N1 epidemic in the United States, patients who were hospitalized with H1N1 infection were primarily children and adolescents.[1] There are limited data available for H1N1 disease in children, especially those who are critically ill.[2-3, 5-6]

Our review identified that children admitted to the PICU on an average had < 2.5 days of symptoms prior to admission and majority had fever and respiratory distress with an abnormal chest radiograph at the time of admission. Similar to the previous reports, almost all children admitted to the PICU had underlying chronic medical conditions.[2, 3] On the other hand, one series reported nearly half of critically ill children had no underlying medical condition.[5] Pulmonary conditions, particularly, asthma was the single most common underlying CMC in our series, a

Table 2:. Radiographic characteristics of the 17 patients with abnormal chest radiographs

Patient	Chest Radiograph Reading
20 year, male	Bilateral pneumonia
12 year, female	Mild bilateral interstitial prominence in perihilar regions
10 year, male	Right upper lobe atelectasis versus pneumonia
9 year, female	Patchy bilateral air space opacity
9 year, female	Patchy parenchymal atelectasis versus pneumonia
8 year, male	Bilateral pneumothoraces, right upper and lower lobe atelectasis. Pneumomediastinum.
8 year, male	Left lobe pneumonia versus atelectasis
8 year, male	Right middle lobe pneumonia
6 year, female	Left lower lobe atelectasis versus pneumonia
6 year, female	Left lower lobe pneumonia with small left lower lobe effusion
5 year, male	Left lung collapse
4 year, female	Pneumomediastinum, multifocal pneumonia, subcutaneous emphysema
20 month, female	Bilateral patchy airspace disease
15 month, male	Peribronchial thickening
9 month, male	Right lower lobe pneumonia versus atelectasis
9 month, female	Mild prominence of interstitial markings
6 month, female	Bronchiolitis with superimposed bilateral upper lobe pneumonia

finding also reported in other studies.[1, 2, 6]

Although the number of cases was small, we did not find a gender or racial difference in the children admitted to the PICU. Published reports show 62-73% male predominance.[2, 5] The percentage of black patients in our report (48%) was similar to previously reported (46%).[2]

Secondary infection was uncommon in our children with only one patient having bacterial secondary infection and this may in part explain the low mortality in our patients. Bacterial secondary infection is a well-recognized cause of increased mortality with influenza infection and has been identified in 23-45% of patients admitted to the PICU.[2, 5, 7] We only had one viral co-infection in our series. In contrast, almost 20% viral co-infection (predominantly with RSV) has been noted in a study from Argentina.[8] In our series there was one death in an infant with complex single ventricle congenital heart disease whose outcome was described as poor even prior to being diagnosed with H1N1 infection.

An interesting finding in our case series was the presence of hypertension in all three patients who required ECMO. It is difficult to reach a conclusion based on three cases but this should be further evaluated. Hypertension was not specifically mentioned as a possible complication in one large study of adult patients with H1N1 infection treated with ECMO or in the Canadian study with children, adolescents and adults.[9, 10] Our patients primarily had respiratory failure and did not have shock or multisystem organ system failure as reported previously.[2, 10]

Previous studies have shown that early use of antivirals for treatment of influenza has the most benefit and starting antivirals within 48 hours of illness is also considered to be optimal.[11] Some experts recommend routine empiric use of antiviral treatment for H1N1 infection during outbreak in those patients admitted to the ICU with a possible H1N1 infection. Antiviral treatment was initiated in our patients on an average 3.4 days after the onset of symptoms while in 11 patients it was initiated within 2 days of onset of symptoms. A high index of suspicion once the virus is circulating in the community is required for early initiation of antiviral therapy.

Our study has several limitations, being a retrospective study and testing being physician and clinically driven, not all patients included in this analysis were confirmed H1N1 infected by CDC protocol. However, we believe that the assumption of H1N1 infection was justified based on the following reasons: no seasonal influenza A infections were identified at our hospital or in the region since the last week of June 2009; patients seen before July 2009 were confirmed to have H1N1 and our series included only those patients tested by more reliable tests (viral culture and PCR) after H1N1 strain was established as the predominantly circulating strain. In a review by Boggild and McGeer on laboratory diagnosis of 2009 H1N1 infections, nucleic acid-base approach for the detection of H1N1 virus was reported as being superior to conventional nonmolecular-based tests.[12] It is most likely that many institutions did not perform confirmatory testing due to overwhelming number of samples and limited number of facilities with the capability to do so.

Second weakness is the lack of objective clinical scoring describing the severity of diseases in the PICU. Statistical analysis showed that both patient groups were well matched except for longer length of stay and possibly, higher rate of complications in the confirmed H1N1 group. This is not surprising since patients who were more seriously ill were the ones whose specimens were more likely to be sent for confirmation by their physicians. Another weakness of the study was the difficulty in determining the extent of H1N1 infection's contribution to the clinical course. For example, two

patients had presenting symptoms such as vomiting and abdominal pain that may be attributable to both diabetic ketoacidosis and to H1N1 infection.[6,8] Finally, some of the patients were discharged before the completion of antiviral therapy and their clinical course off antiviral treatment was unknown. We had no post-hospital follow-up for the patients in our series.

There are limited data on pediatric patients with H1N1 infection. Although there are similarities among reports, there are also variations in findings. A larger sample size and better study design are warranted to reach more definitive conclusions.

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Streptococcus pneumoniae: Frequency, Susceptibility, Clinical Features and Outcome at a Tertiary Care Hospital

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Abstract

Introduction
Streptococcus pneumoniae, a significant pathogen, causes mostly upper respiratory tract infections or invasive pneumococcal disease such as pneumonia, bacteraemia and meningitis in adults and children. Isolation of *S. pneumoniae* from clinical specimens is difficult and there is a paucity of data in Pakistan.

Objectives
To determine the frequency, susceptibility, clinical features and mortality due to *S. pneumoniae.*

Setting
Shifa International Hospital, Islamabad

Material and methods
This was a retrospective study from 1st June to 31st August 2010. All patients who presented at Shifa International Hospital (SIH) between August 2008 and May 2010 and had positive culture for *S. pneumoniae* were included in the study. Medical records were analyzed to collect the relevant data.

Results
Out of 16785 specimens, 4815 (28%) yielded growth of various pathogens. Thirty-two (0.7%) specimens revealed growth of *S. pneumoniae*. The mean age of patients was 32.7 years (range: 2 months -75 years). Majority (59.3%) were males. Thirteen (41.9%) were children < 16 years of age and of these five (38.4%) were less than 12 months old. Fever was the most common presenting feature (87.5%) followed by cough (47%), shortness of breath (53%) and coma (34%). *S. pneumoniae* was most frequently isolated from blood (53%) followed by tracheal aspirate (13%) and cerebrospinal fluid, sputum and ear swabs (9% each). The organism was isolated within 24-48 hours in 85.2% of cases. Antibiotic resistance was seen in 7 (21.8%) isolates but only one (3.7%) isolate was resistant to penicillin. All the isolates were susceptible to cephalosporins. There were 5 (15.6%) deaths and out of them two were children.

Conclusion
S. pneumoniae isolation rate was 0.7% in our patients with high susceptibility to penicillin (96.3%). Mortality was high.

Key words
Bacteraemia, Invasive Pneumococcal Disease, Penicillin Susceptibility, *Streptococcus pneumoniae*.

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Introduction
Streptococcus pneumoniae is a polysaccharide encapsulated gram positive, diplococcus occurring in chains. Approximately 90 serotypes have been identified so far. Their virulence is related to the polysaccharide capsule, which impedes phagocytosis. *S. pneumoniae* colonizes the upper respiratory tract of most healthy individuals and is highest (50% or more) in children under five years age.[1] More than 90% children (6 months to 5 years) carry *S. pneumoniae* in nasopharynx at some point in time. Rate of *S. pneumoniae* carriage peaks during the first 2 years of life and decline gradually thereafter.[1]

Clinically *S. pneumoniae* is the most frequent cause of Invasive Pneumococcal Disease (IPD) such as bacteraemia, pneumonia and otitis media. Other invasive illnesses include focal suppurative complications associated with bacteraemia such as meningitis, osteomyelitis, septic arthritis, endocarditis and brain abscess. Children with sickle cell disease, congenital or acquired asplenia, HIV, immunodeficiency and cochlear implants are at high risk for IPD. Pneumococcal disease occurs sporadically but can spread from person to person by respiratory droplet transmission. WHO estimates that, worldwide, 1.6 million deaths were caused by pneumococcal disease in 2005, with 700,000 to 1 million of these occurring in children younger than 5 years.[2] IPD also has a high mortality rate in developed countries with rates of 10-20% in adults with pneumococcal pneumonia; much higher rates in those with risk factors.[3,4]

The objective of our study was to determine the frequency, susceptibility, clinical features and outcome of *S. pneumoniae* among patients presenting at our hospital.

Material and methods
This was a retrospective study carried out at SIH, from 1st June

through 31st August 2010. All patients who presented at SIH between August 2008 and May 2010 and had positive culture for *S. pneumoniae* were included. Positive patients were identified through microbiology data bank. Samples were selected by non-probability convenient sampling. Samples that were submitted for culture and sensitivity included blood, CSF, tracheal aspirate, pleural and pericardial fluid, pus and high vaginal swabs. Becton Dickinson (BD) BACTEC™ blood culture Media culture bottles were inoculated with specimen and incubated in BACTEC™ 9240**,** BD Systems. Further identification of the isolates was carried out by standard method of Clinical and Laboratory Standard Institute (CLSI). Culture sensitivity was performed by Kirby-Bauer disc diffusion method. Demographic and clinical features, radiologic findings and microbiologic patterns along with time to organism isolation were recorded on a predesigned performa. The data analysis was done using the SPSS version 16.

Results

Out of the total of 16785 specimens received in the Microbiology laboratory of SIH over 22 months study period, 4815 (28%) yielded growth of various pathogens. Among them thirty-two (0.7%) specimens from 31 patients revealed growth of *S. pneumoniae*. The mean age of the patients was 32.7 years (range: 2 months -75 years). Majority (59.3%) were males. Thirteen (41.9%) were children < 16 years of age and of these 5 (38.4%) were less than 12 months old.

Nearly all patients had some underlying illness, including chronic liver disease (18.5%), recurrent meningitis, diabetes mellitus chronic obstructive pulmonary disease (11.1% each) and sinusitis (7.4%). A small minority (3.7% each) had underlying malnutrition, bronchiectasis, chronic renal failure or nephrotic syndrome.

Fever was the most common presenting feature (87.5%) followed by cough (47%), shortness of breath (53%) and coma (34%). Other presenting features included seizures (18.5%), ear ache (7.4%), arthritis and vaginal discharge (3.7% each). Nearly half of the patients had presented with bacteraemia whereas 47% had pneumonia. Among them 40% had bilateral lung infiltrates, 33% had pleural effusion and 26% had evidence of lobar consolidation. Nine percent of patients had meningitis and otitis media each.

S. pneumoniae was isolated from blood (53%), tracheal aspirate (13%) and cerebrospinal fluid (CSF), sputum and ear swab (9% each), and pericardial and vaginal swab (3.1% each).

In majority of patients (81.2%), the organism was isolated within 24-48 hours while in 9% cases; it was isolated <24 hours. Susceptibility pattern showed that there was high susceptibility to penicillin and cephalosporin among the *S. pneumonia* isolates (Table 1). Overall mortality was 15.6%. Among them 40% were children under 1 year of age.

Discussion

Despite the worldwide importance of disease due to *S. pneumoniae* infection, very little information is available on the extent of IPD particularly in developing countries. Although exact numbers are difficult to obtain, it is estimated that pneumococcal infection is responsible for more than one million of the 2.6 million annual deaths due to acute respiratory infection (ARI) in children younger than 5 years. The estimates of incidence of IPD in children <1-2 yrs is 100-200/100000 and in older children 40 cases/ 100000.[5,6]

Table 1: Susceptibility pattern to commonly used antibiotics

Antibiotic	**Percent Susceptible**
Penicillin	96.3
Cephalosporin	100
Macrolides	97
Quinolones	87.5

Case fatality rates due to IPD may approach 50% and are greatest in patients with meningitis.[7,8] The lack of quality laboratory facilities, poor use of cultures and the very fastidious nature of the microorganism itself to grow in special media may be some of the factors responsible for difficulty in isolating the organism. The Asian Strategic Alliance for Pneumococcal Disease Prevention (ASAP) Working Group collected data regarding IPD from some countries including Hong Kong, India, Indonesia, Korea, Macau, Malaysia, Pakistan, the Philippines, Singapore, Sri Lanka, Taiwan and Thailand.[9] The data was good in some countries but grossly lacking in others and stressed on more robust data about IPD. In Pakistan not much is known about the true burden and nature of IPD. Limited data suggest that IPD incidence in Pakistani children was 25 (95%CI:1-125) episodes per 100,000 child years.[10] In Sindh, *S. pneumonia* was isolated from CSF in 38.5% of 2690 children with acute bacterial meningitis.[11] *S. pneumonia* constituted 59.7% of the isolates in acute meningitis at Nawabshah.[12] It was the commonest (22.5%) isolate among 120 children (2 months-12 years) with meningitis in Peshawar.[13] In our study including adults and children, *S. pneumoniae* was not one of the common isolates, accounting for only 0.7% of the total isolates.

The commonest presentation of *S. pneumoniae* is pneumonia (85%) followed by bacteremia (6%) and meningitis (4%) as revealed by a USA study on 116 adult patients.[14] In children as well it causes IPD including pneumonia, bacteremia and meningitis. A Peruvian study of 101 children with IPD reveals pneumonia as the most frequent presentation (47.5%) followed

by meningitis in 38.6% cases.[15]Among children 68.3% were less than 24 months old. *S. pneumoniae* may also be one of the common isolates in Pakistani children presenting with pneumonia and meningitis. In Sindh, it was isolated from CSF in 38.5% of 2690 children with acute bacterial meningitis.[11] *S. pneumoniae* constituted 59.7% of the isolates in acute meningitis at Nawabshah and was the commonest (22.5%) isolate among 120 children (2months-12 years) with meningitis in Peshawar.[12,13] In our small series of patients bacteraemia and pneumonia were common.

The diagnosis is established by the recovery of *S. pneumoniae* from the site of infection or sterile site such as CSF or blood. The average time to isolation of pneumococcus is 14-15 hours and rarely >48 hours. Leucocytosis is often pronounced and in severe cases there may be leucopenia. The chest x-ray in pneumococcal pneumonia often reveals lobar consolidation. However, in our study, majority of the patients (40%) had bilateral lung infiltrates and 26% had lobar consolidation.

Limitations of our study include: a retrospective study, small numbers, combining both children and adults and not using the strict CLSI 2010 definition for *S pneumoniae* susceptibility. Despite that we believe that this small series will add to our understanding the *S. pneumoniae* disease in Pakistan.

S. pneumoniae has become more significant over the past few decades because of worldwide emergence of resistant strains. Historically, penicillin resistant strains were first isolated in Boston in 1965.[16] Since then, penicillin resistant as well as multidrug resistant strains have been reported in different parts of the world including Pakistan.[17] In USA 24.8% of all isolates obtained showed intermediate or resistant susceptibility patterns to penicillin.[18] The prevalence of resistance varies greatly among countries and within populations and may be as high as 30%-35% in some locations.[19,20] Resistance rates are generally higher in most European countries, as well as in Hong Kong and Thailand.[21,22] A pneumococcal surveillance network in France screened 5302 patients with IPD and 38.2% were found to be resistant to penicillin.[23] A 2-year multicenter passive surveillance study conducted from May 2006 to April 2008 among children in 11 public hospitals and five private laboratories in Lima, Peru showed that among 101 isolates, 22.8% were penicillin resistant.[15] Mantese *et al* analyzed 142 of pneumococcal strains obtained from children under 5 years of age and found 9.9% to be penicillin resistant.[24] Penicillin resistance in Pakistan was first reported in 1999 when Hussain *et al* found 46.2% of isolates of *S. pneumoniae* to be penicillin resistant.[25] However, studies in recent years have reported a very high susceptibility to penicillin and cephalosporins but the resistance to macrolides remains high. In Karachi, majority (>95%) of isolates of *S. pneumoniae* were found susceptible to Cefaclor.[26] In 2005, Butt *et al* revealed that among 10% *S. pneumoniae* isolates out of 88 specimens studied, only one was resistant to penicillin.[27] In 2008, Zafar *et al* studied 100 isolates of *S. pneumoniae*. All were found susceptible to amoxicillin, co-amoxiclav and cefixime and 72% were susceptible to macrolides.[28] In our hospital, *S. pneumoniae* isolates were found to be highly susceptible to penicillin (96.3%) and cephalosporin (100%). So penicillin or derivatives could be used for empirical therapy in non-severe cases pending susceptibility results.

All isolates of *S. pneumoniae* should be tested for susceptibility to penicillin and cefotaxime or ceftriaxone. The CSF isolates should be tested further to vancomycin and meropenem. CSF isolates that are found to be nonsusceptible to penicillin should be tested for susceptibility to rifampicin as well. Microbiological laboratories should follow established guidelines regarding inoculum size and media (Mueller-Hinton agar with sheep, horse, or lysed horse red blood cells). The invasive disease isolates should undergo testing with quantitative minimal inhibitory concentration (MIC) techniques (broth microdilution, antibiotic gradient strips such as the E-test).

The CLSI (2010) has defined *S. pneumoniae* susceptibility (Table 2).[29,30] Strains with intermediate or resistant susceptibility patterns should be considered non susceptible and alternate therapy used.

The empirical treatment of pneumococcal disease should be based on site and severity of infection as well as the knowledge of susceptibility pattern of *S. pneumoniae* in that community. Generally penicillin G (or Ampicillin) is the drug of choice for penicillin susceptible strains. Vancomycin is the only glycopeptide antibiotic that has demonstrated effectiveness against pneumococcal infections. To date, no clinical or *in vitro* evidence of pneumococcal resistance to vancomycin has been reported. In children vancomycin is also the drug of choice (with a third-generation cephalosporin) in the empirical treatment of pneumococcal meningitis pending culture results.[31] The

Table 2. MICs and susceptibilityof *S. pneumoniae* against penicillin and cephalosporins (CLSI 2010)

Drug	Site of infection	Susceptibility pattern	MIC (µg/ ml)
Penicillin	Non CNS / CNS Infections	Susceptible Intermediate Resistant	≤2/0.06 4 ≥ 8/0.12
Cefotaxime or Ceftriaxone	Non CNS / CNS	Susceptible Intermediate Resistant	≤ 1/0.5 4/1 ≥ 4/2

increased number of pneumococcal isolates resistant to trimethoprim-sulfamethoxazole precludes its use unless susceptibilities are known and beta-lactam use is contraindicated. Clindamycin may also be used to treat non-meningeal *S. pneumoniae* infections. Penicillin or macrolide resistance may also be associated with clindamycin resistance in individual isolates. Carbapenems are also effective against *S. pneumoniae* but should be reserved for specific cases given their broad coverage and the potential for development of resistance by multiple organisms (Table 3).[32]

The outcome of IPD due to *S. pneumoniae* depends largely on underlying factors, including age, presentation, prior vaccination status, immunosuppression, availability of antibiotics, and extent of organ involvement. Prevention includes pneumococcal vaccines, which has not only decreased its burden but also shown that the rate of antibiotic resistant invasive pneumococcal infections decreased in young children and older persons after the introduction of the conjugate vaccine.[33]

Table 3: Treatment guidelines for *S. pneumoniae*

Age Group	Disease	Risk Factors	Recommended Antibiotics
Children	Pneumonia	None	Amoxicillin Amoxicillin-Clavulanate
		Sick/ Hospitalized	Penicillin Ampicillin-Sulbactam Ceftriaxone
		Critically ill / Immunocompromised	Broad spectrum Cephalosporin Vancomycin
	Meningitis		Ceftriaxone or Cefotaxime Plus Vancomycin
Adults		None	Macrolide or Doxycycline
		Chronic disease/ Immunosuppression / Recent use of antibiotics/ Patients admitted in Medical ward	Respiratory Fluoroquinolone (Moxifloxacin, Levofloxacin) or Beta lactam antibiotic (High dose Amoxicillin, Amoxicillin-Clavulanate or Second or third generation Cephalosporin Plus Macrolide or Doxycycline
		ICU patients	Beta lactam antibiotic Plus Macrolide or Fluoroquinolone

In conclusion, this study demonstrates that *S. pneumoniae* disease is present in children and adults with significant mortality. Isolation rate may be low but susceptibility pattern reveals that penicillin or derivatives could be used for empirical therapy in non-severe cases.

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ORIGINAL ARTICLE

Antimicrobial Susceptibility Pattern of *Acinetobacter* Species – One Year Experience in a Tertiary Care Setting

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Abstract

Objective
To find out antimicrobial susceptibility pattern of Acinetobacter species isolated from 1st January 2009 through 31st December 2009 at Department of Microbiology, Armed Forces Institute of Pathology Rawalpindi.

Materials and Methods
A total of 276 isolates of *Acinetobacter* spp yielded from various clinical specimens during the study period were included. Routine conventional methods were used to identify various species of Acinetobacter and modified Kirby-Bauer disk diffusion method was used for susceptibility testing.

Results
Out of total 276 isolates, 176 (63.8%) turned out to be *Acinetobacter baumannii* and 100 (36.2%) were *Acinetobacter johnsonii*. Overall sensitivity of *Acinetobacter* spp against piperacillin/sulbactam, tigecycline, sulbactam/cefoperazone, piperacillin/tazobactam, imipenem, doxycycline, ceftazidime, ciprofloxacin, chloramphenicol, trimethoprim/sulfamethoxazole, amikacin, gentamycin, ceftriaxone, amoxicillin/clavulanic acid and ampicillin were 64%, 63%, 48%, 47%, 41%, 39%, 35%, 34%, 32%, 31%, 29%, 19%, 18% and 5% respectively. Out of 276 isolates, 181 (66 %) were multidrug resistant while 33 (18 %) isolates were pan-drug resistant.

Conclusion
Multidrug resistant isolates of *Acinetobacter* spp are rapidly emerging in hospital settings while resistance to carbapenems, considered as the most effective antimicrobials against these isolates, is increasing at an alarming rate. It is therefore imperative to make hospital antibiotic policies with judicious use of antibiotics.

Key words
Acinetobacter spp, Multidrug Resistance (MDR), Nosocomial Infections, Pan-drug Resistance (PDR).

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Introduction
Recent attention has been more focused on the growing impact of infections caused by methicillin-resistant *Staphylococcus aureus* and multidrug-resistant *Pseudomonas aeruginosa*, the *Acinetobacter* spp has been stealthily gaining ground as an agent of serious nosocomial and community-acquired infection. Historically, *Acinetobacter* spp has been associated with opportunistic infections that were rare and of modest severity, but the last two decades have seen an increase in both the incidence and seriousness of Acinetobacter infections. Although this organism appears to have a propensity for the most vulnerable patients, community-acquired Acinetobacter infection is an increasing cause of concern.[1]

There are currently 32 Acinetobacter, named and un-named, species.[2-4] Genus Acinetobacter consists remarkably hardy organisms, tolerant to wide ranges in temperature, pH and humidity. It has been shown to be able to survive on dry surfaces for months, posing a challenge to hospital infection control measures.[5] It mostly inhabits moist environment and can be isolated from food, water, sewage and soil. It has been isolated from hospital equipment, bedding, furniture and staff.[4] Contamination of hospital devices with MDR (resistance to three or more than three groups of antibiotics) Acinetobacter isolates has been documented for ventilator tubing, suction catheters, humidifiers, potable water, bedding and improperly sterilized arterial pressure transducers.[6] In recent years, they have emerged as an important cause of various hospital associated infections with high mortality rates. A number of nosocomial outbreaks of pneumonia, wound infections, endocarditis and meningitis have been reported. *Acinetobacter baumannii* has the ability to replicate and survive in the hospital environment due to its tolerant nature and multidrug resistance.

Acinetobacter causes a wide range of serious infections and is a major cause of bacteremia, pneumonia (particularly ventilator-associated pneumonia), meningitis and urinary tract infections.[2] Infections attributed to this organism have been reported around the world and are increasing in incidence.[7-9] It causes 2-10% of all Gram-negative ICU infections in the USA and Europe.[7] Given that the majority of *Acinetobacter* spp recovered from patients are MDR, treatment of these infections is challenging.

There have also been reports of pan drug resistant Acinetobacter spp, which are essentially resistant to most of the marketed antibiotics.[10,11] There have also been a limited number of reports regarding community-acquired Acinetobacter infections, with pneumonia, bacteremia and cellulitis being the most prevalent. These patients are typically characterized with additional comorbidities, such as diabetes mellitus, chronic obstructive pulmonary disease (COPD) and/or alcohol abuse.[10] Therapeutic choices available for these isolates are carbapenems, aminoglycosides, ß-lactamase inhibitors, third generation cephalosporins, tigecycline and polymyxin. However, MDR-*Acinetobacter* spp are rapidly becoming resistant to the most effective carbapenems group of antibiotics. Therefore, it is necessary to prevent the transmission of MDR Acinetobacter infection and to develop new therapeutic options.

The objective of this study was to find out antimicrobial susceptibility pattern of *Acinetobacter* spp isolated from clinical specimens received at AFIP from different set-ups of Rawalpindi and surroundings.

Materials and methods

This laboratory based descriptive study was carried out at Department of Microbiology, Armed Forces Institute of Pathology, Rawalpindi. A total of 276 isolates of *Acinetobacter* spp isolated from 1st January 2009 through 31st December 2009 from various clinical samples, were included in the study. In the protocol followed, all the clinical specimens (pus, urine, sputum, bronchial lavage, endobronchial washings, blood, catheter tips, CSF, fluids and tissue) were inoculated on 5% Sheep Blood Agar (Oxoid, UK), MacConkey agar (Oxoid, UK) and incubated at 37ºC for 24-48 hours. All the blood samples were incubated in BacT/ALERT bottles (Biomerieux, Brasil) and subcultured on 5% Sheep Blood Agar and MacConkey agar. Urine samples were inoculated on CLED (Oxoid, UK) agar and incubated at 37ºC for 24 hours. Cream colored, smooth colonies with no pigmentation on blood agar while a pinkish shade on MacConkey agar were Gram stained for gram negative coccobacilli and further oxidase, catalase and motility tests were performed. Confirmation and species differentiation was done with API 20NE (Biomerieux, France). Antimicrobial susceptibility testing was carried out on Mueller-Hinton Agar (Oxoid, UK) with piperacillin/sulbactam (Oxoid UK), tigecycline 30µg (Oxoid UK), sulbactam/cefoperazone 110µg (Oxoid UK), piperacillin/tazobactam 110µg (Oxoid UK), imipenem 10µg(Oxoid UK), doxycycline 30µg(Oxoid UK), ceftazidime30µg (Oxoid UK), ciprofloxacin 5µg (Oxoid UK), chloramphenicol 30µg (Oxoid UK), trimethoprim/sulfamethoxazole 25µg (Oxoid UK), amikacin 30µg(Oxoid UK), gentamicin 10µg (Oxoid UK) and ceftriaxone 30µg (Oxoid UK), by using modified Kirby-Bauer disk diffusion method. In case of a pan drug-resistant isolate, polymyxin was used as an extended drug. An isolate resistant to three or more group of antibiotics was labeled as MDR. *Escherichia coli* ATCC 25922 (ß-lactamase negative) and *Acinetobacter baumannii* AFIP were used as control strains.

Results

Out of total 276 isolates, 184 (67%) were from male patients and 92 (33%) from female patients. The patient age range was 3-78 years with maximum number of patients in the fifth decade and mean age ± SD was 38 ± 15.2 years. *Acinetobacter baumannii* was the dominant species with 176/276 (63.7 %) isolates whereas rest were identified as *A. johnsonii*.

Maximum numbers of isolates were recovered from pus followed by blood, urine and endobronchial washing as shown in Fig 1.

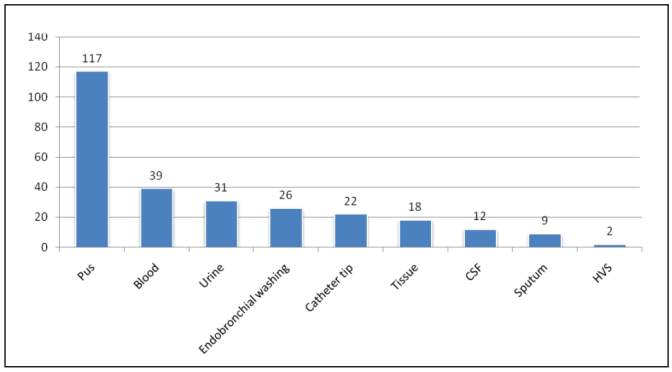

Figure 1: Frequency of isolation of *Acinetobacter* spp from various clinical specimens (n=276)

Maximum number of *Acinetobacter* spp were isolated from clinical specimens received from surgical units 121/276 (43.8 %) followed by intensive care unit 65/276 (23.5 %), orthopedic ward 45/276 (16.3 %), OPD 25/276 (9.0 %), urology ward 16/276 (6.0 %) and from ENT ward 3/276 (1.0 %).

In vitro antimicrobial susceptibility revealed that 64% of our isolates were susceptible to piperacillin/ sulbactam, followed by tigecycline 63%, The antimicrobial susceptibilities against other antibiotics is shown in fig 2.

Frquency of MDR and Pan-drug resistant *Acinetobacter* isolates is shown in fig 3.

Out of 176 isolates of *A. baumannii*, 114 (64 %) were MDR and 30 (17 %) were PDR. In case of *A. Johnsonii*, 39 (39 %) were MDR and 3 (3 %) were PDR. All the PDR isolates were sensitive only to polymyxin.

Discussion

Acinetobacter baumannii was found to be the predominant species in our study. An earlier study (2009) at the same institute also reported that *A. baumannii* outnumbered other species with 79% of the total isolates. In that study it was emphasized that *A. baumannii* was exhibiting MDR.[12] The results of our study also show similar findings but with a new trend that quite a large

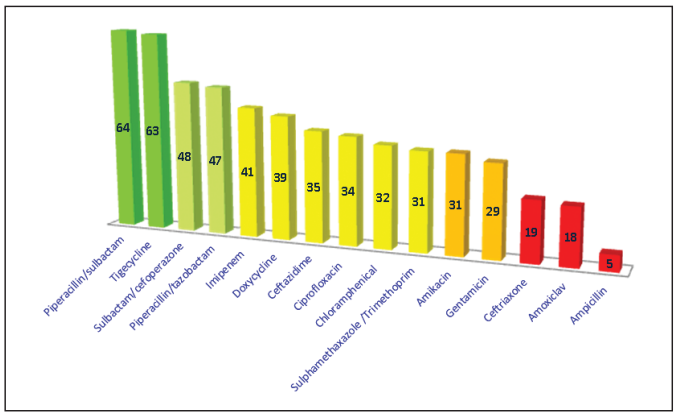

Figure 2: Percentage susceptibility pattern of *Acinetobacter* spp against different antimicrobials (n=276)

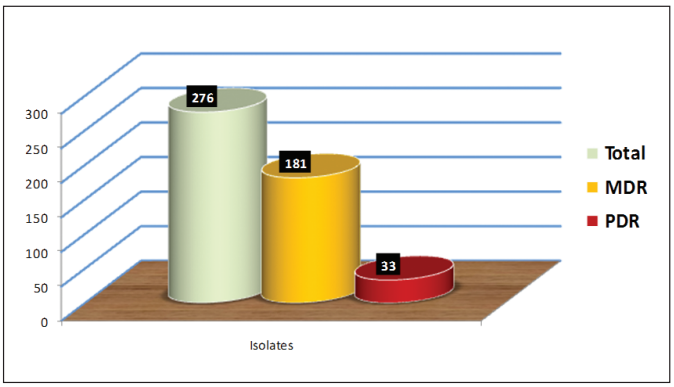

Figure 3: Frequency of MDR and Pan-drug resistant isolates of *Acinetobacter* spp.

percentage of *A. johnsonii* isolates showing MDR. Even PDR cases are also on the rise with 17% of *A. baumannii* and 3% of *A. johnsonii* showing this trend. Another finding was, that in previous study *Acinetobacter* spp were mostly susceptible to imipenem followed by sulbactam/cefoperazone and than to tazobactam/piperacillin. In our study, *Acinetobacter* spp were most susceptible to tigecycline followed by sulbactam/cefoperazone, piperacillin/tazobactam and imipenem.

In this study, maximum number of *Acinetobacter* spp were yielded from pus, highlighting the importance of *Acinetobacter* spp causing wound infections. Majority of the isolates were recovered from specimens sent from surgical units followed by intensive care units. This intensifies the fact that these isolates are major cause of wound infections and catheter/ventilator associated infections in surgical units and intensive care units. In the previous study conducted at AFIP, only 3.9% isolates were recovered from outpatient department as compared to 9% in this study which signifies its importance as pathogen in community acquired infections.[12]

In a study done in Iran in 2008, *Acinetobacter* spp showed maximum susceptibility to carbapenems (50 %), followed by piperacillin/tazobactam (42 %) and amikacin (38 %).[13] These results of carbapenems susceptibility were different from our study in which only 41% of isolates were susceptible to carbapenems while results of piperacillin/tazobactam and amikacin were in the similar range with 47% and 31 % of our isolates susceptible respectively.

In an Indian study (2004), amikacin (55 %) was the most effective antibiotic followed by ceftazidime (42 %), ciprofloxacin (37 %) and gentamicin (34 %).[14] Our study has revealed 31% of isolates susceptible to amikacin. This trend indicates that *Acinetobacter* spp are rapidly becoming resistant to this antimicrobial.

No single antimicrobial has the potential to fully eradicate infections caused by *Acinetobacter* spp. MDR *Acinetobacter* spp are becoming serious threat for the community and posing therapeutic problems to the clinicians. It is prudent that we follow good infection control practices to prevent serious infections with *Acinetobacter* spp. As this organism is rapidly changing its susceptibility pattern, we cannot rely on foreign data for its treatment and thus we must have our own antimicrobial susceptibility pattern to effectively treat our patients. This can be very helpful in case of outbreaks.

Conclusion

MDR *Acinetobacter* spp are emerging in our setup at a rapid rate. It is responsible not only for hospital acquired infections but increasingly implicated in community acquired infections as well. PDR organisms are also getting grounds in our setup thus narrowing the antimicrobial choice. Active surveillance is thus very crucial and only hope for the survival against outbreaks involving *Acinetobacter* spp.

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ORIGINAL ARTICLE

Knowledge and Attitudes towards Voluntary Blood Donation among Students of a Private Medical College

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Abstract

Objective
To assess the knowledge and attitude of medical students regarding voluntary blood donation and investigate factors affecting voluntary blood donation.

Methods
This was a cross sectional survey done during the year 2010 targeting the medical students of Ziauddin Medical College, Karachi. All students of the College from first to final year MBBS in the current year were assessed through questionnaire.

Results
There were a total of 350 students enrolled in MBBS, out of these 310 completed the questionnaire. Among these 148 (47.7%) were male and 162 (52.3%) female. The most common transfusion acquired disease identified was HIV by 124 (83.8%) males and 139 (85.8%) females. The most common risk factor with blood transfusion identified was acquiring infectious diseases 114 (77%) and 132 (81.5%) females. Contraindication for blood transfusion identified most commonly was communicable diseases by 119 (80.4%) males and 131 (80.9%) females. Most of the students 96 (64.9%) males and 87 (53.7%) females had planned to donate blood in future.

Conclusion
The study shows that there are several factors that play role in motivating volunteers to donate blood. It is important to create and strengthen the donor recruitment strategies especially for younger generation.

Key words
Blood Donation, Blood Transfusion.

Introduction

Transfusion of blood and blood products is one of the most common procedures in medical profession, especially in acute life threatening situations like trauma, major surgeries, inherited blood dyscariasis and anemia. According to one estimate, approximately 81 million units of blood are donated each year worldwide, out of which only 42% is collected in developing countries accounting for 80% of world's population.[1] According to WHO, a country could meet its requirements if only upto 3% of that country's population donate blood. It is quite unfortunate that less than 1% of population donate blood in about 73 countries, and out of these 70 are either developing or transitional countries.[2]

Considering Pakistan, 70% of the donated blood comes from replacement donors, 20% from voluntary donors and 10 % from paid donors.[3] Majority of blood (70%) collected in Pakistan is transfused to children suffering from thalasemia.[4] Blood from voluntary donors is generally safe as it is associated with lesser risk of transfusion related infections like Hepatitis B, Hepatitis C, HIV, etc.[4]

Pakistan, with its meager resources, has 170 public and 450 private blood banks that are mostly hospital based.[5] The system, however, lacks information regarding retention of donors, record keeping and recruitment of donors in most of the blood banks.[5] A study done in Pakistan revealed inadequate knowledge, inappropriate attitude and misconceptions about blood donation in Army personnel.[6] Another study done in Thai University showed 80% students had knowledge about blood donation, whereas only 11% donated blood voluntarily.[7] Another survey done among donors in Mashhad showed very little knowledge (<30%) regarding blood donation.[8]

WHO and Red Crescent Society in collaboration have started a programme for promotion of voluntary blood donation among youth (18-25 years). This programme emphasizes on at least 20 blood donations before 25 years of age.[9] A study done among university students of Chile showed that 88.1% students were planning to donate blood.[10]

Medical students are future health educators, who can play a significant role in educating colleagues and general public

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regarding the importance and need of voluntary blood donation. In this study, we aimed to assess the knowledge and attitude of medical students regarding voluntary blood donation and investigate factors affecting voluntary blood donation.

Materials and methods

This cross sectional survey, targeting medical students of Ziauddin Medical College, Karachi, was done during 2010. All students of the College from first to final year MBBS in the current year were included. The data was collected on a pre-tested self administered questionnaire after obtaining informed verbal consent. A total of 310 students were surveyed using non-probability purposive sampling method. Questionnaires were distributed simultaneously to all the students of one class at the end of their lectures and they were given 20 minutes to respond to the questions independently. All the results were analyzed using SPSS version 17. Frequencies were calculated for the gender and knowledge. Mean and standard deviation were calculated for the age of respondents.

Results

There were a total of 350 students enrolled in MBBS, out of these 310 completed the questionnaire. Among these 310 respondents, 148 (47.7%) were male and 162 (52.3%) female.

Table 1 summarizes the knowledge regarding: voluntary blood donation, diseases which can be acquired via transfusion, donation status and future plans regarding voluntary blood donation. The most common disease identified was HIV by124 (83.8%) males and 139 (85.8%) females, the second common disease was Hepatitis C recognized by 112 (75.7%) males and 114 (70.4 %) females.

The most commonly identified risk associated with blood transfusion was fear of acquiring infectious diseases 114 (77%) and 132 (81.5%) females. The second common risk was severe fatigue by 44 (29.7%) males and 50 (34.6) females.

The most important criteria identified for blood donations was good health of donor by 106 (70.9 %) males and 129 (79.6 %) females followed by donors weight of 100 lb or more by 87 males (58.8 %), and an interval of at least 3 months by 101 (62.3%) females. Contraindications identified for blood transfusion were communicable diseases by 119 (80.4%) males and 131 (80.9%) females, followed by donors using drugs like aspirin and anticoagulant by 109 (73.6%) males and 99 (61.1%) females.

Regarding donation status, 93 males (62.8%) and 43 females (26.5%) had donated blood in past. Most of the students 96 (64.9%) males and 87 (53.7%) females had planned to donate blood, whereas only a small number, 16 (10.8%) males and 13 (8.0%) females had no such plans. A significant number of students, 36 (24.3%) males and 62 (38.3%) females, were

Table 1: Knowledge regarding blood transfusion

	Male n=148 (47.7%)	Female n=162 (52.3%)
Diseases which can be acquired via transfusion		
Hepatitis B	109 (73.6%)	104 (64.2%)
Hepatitis C	112 (75.7%)	114 (70.4%)
Malaria	61 (41.2%)	50 (30.9%)
HIV	124 (83.8%)	139 (85.8%)
Tuberculosis	15 (10.1%)	11 (6.8%)
Risk associated with transfusion		
Weight gain	12 (8.1%)	4 (2.5%)
Weight loss	30 (20.3%)	26 (16%)
Infertility	7 (4.7%)	0 (0%)
Acquiring infectious disease	114 (77%)	132(81.5%)
Bruising at phlebotomy site	47 (31.7%)	56 (34.6%)
Severe fatigue	44 (29.7%)	56 (34.6%)
Criteria for donating blood		
Donor's age 17 or more	86 (58.1%)	98 (60.5%)
Donor's weight 100 lb or more	87 (58.8%)	75 (46.3%)
Good health of donor	105 (70.9%)	129 (79.6%)
Interval of at least 3 months	76 (51.3%)	101(62.3%)
Pregnant female	4 (2.7%)	4 (2.5%)
Contraindications of blood transfusion		
Alcoholism	80 (54.1%)	80 (49.4%)
Drugs (aspirin, anticoagulant)	109 (73.6%)	99 (61.1%)
Communicable diseases	119 (80.4%)	131 (80.9%)
Previous history of malaria or hepatitis	78 (52.7%)	95 (58.6%)
History of allergies	58(39.2%)	62 (38.3%)
Ever donated blood		
Yes	93 (62.8%)	43 (26.54%)
No	55 (37.2%)	119 (73.5%)
How often donated		
Weekly	3 (2%)	3 (1.8%)
Monthly	4 (2.7%)	7 (4.3%)
Every 3 months	79 (53.4%)	89 (54.9%)
Every 6 months	32 (21.6%)	48 (29.6%)
Annually	30 (20.3%)	15 (9.3%)
Plan for future donation		
Yes	96 (64.9%)	87 (53.7%)
No	16 (10.8%)	13 (8.0%)
Don't know	36 (24.3%)	62 (38.3%)

confused regarding personal blood donation. Regarding the minimal duration between consecutive donations, the most common response was every 3 months by 79 (53.4%) males and 89 (54.9%) females followed by every 6 months by 32 (21.6%) males and 48 (29.6%) females.

Table 2 summarizes reasons for donating or not donating in the past. The most common reason for blood donation recognized by both the groups was social responsibility, 25% males and 12.9% females followed by mobile blood collecting units by 20.3% males and 7.4% females. The most common reasons for not donating blood identified in males was that no one close relatives needed whereas female rejection as blood donors.

Discussion

Numerous studies have been conducted on the knowledge, attitudes and practices regarding blood donation in Pakistan, mainly focusing on general population and paramedical staff.[11,12] However, to the best of our knowledge, this is the pioneer study in identifying the knowledge and attitudes of the medical students for blood donation. In this study, 44% of the participants had donated blood previously, whereas in the developed countries percentages are as high as 59%.[13-15] However, in another study, the figures are as low as 3-8%.[16] In Iraq, 39% of the study population donated blood voluntarily, while a study conducted in Greece showed that 16.6% of the students volunteered to donate blood.[17-19]

Table 2: Reasons for donation and not donation

	n	%age
Reasons for donation (136)		
Sick relative	33	10.6
Influenced by friend	35	11.3
Advertisement on media	29	9.4
Mobile units	42	13.5
Altruism	25	8.1
Screening of diseases	7	2.3
Social responsibility	58	18.7
Good for health	37	11.9
Reasons for not donation (174)		
Fear of discovering illness	21	6.8
Fear of needles	35	11.3
Fear of fainting	24	7.7
Lack of time	23	7.4
Fear of looking at blood	9	2.9
Fear of risk of being infected	26	8.4
Fear of pain	24	7.7
No one asked to donate	37	11.9
No one closed needed blood	47	15.2

Voluntary blood donation is related to many factors including knowledge and attitude, beliefs and traditions about blood donation in that society. In this study, we found that there is a lack of knowledge regarding blood donation in the medical students. This study shows lack of knowledge among medical students related to blood transfusion criteria. Above 40% of the students believed that donors should be aged between 17-45 years, these results are consistent with a study conducted in Saudia.[6] However, the recommended upper age limit for a blood donor is 60 years.[20] The study also identified ignorance of students for the recommended weight for the donors, although the majority of the participants were aware of the fact that the donors having at least 50 kg or 110 lb could donate blood. [20] Good health of donor was deemed essential by almost all the participants. Whole blood donations can be given within a time span of 56 days depending upon the hemoglobin level; nevertheless in our study 57% of the participants were of the perception that a time period of at least 3 months is required to donate the blood.[21] The lack of knowledge for the basic criteria for donating blood may be due to the difference in knowledge level of participants who had donated blood previously, as usually the information sought from the donors prior to the blood collection.[22]

The finding that female donors are almost half as compared to the males is due to the fact that in our society females are considered to be a weaker sex and at times because of social restrictions.[23] These results are congruent with other studies conducted in Saudi Arabia and Nigeria, that the few women, who donate, do so when their close relatives are ill and if no male is available to volunteer.[24]

It is worth mentioning here that the most important reason for blood donation in our study is due to social responsibility and altruism. These results are inconsistent with studies conducted in America and other developed countries where incentives includes blood investigations, souvenirs, lottery tickets, etc.[25,26] Although incentives are considered to play a major role in attracting donors, however, our study and a similar study conducted in Iran concluded that moral and social responsibility are the main reasons for donation.[27] Ill health of the relatives and mobile units have been source for donation. However, the most important reason for not donating blood in this study was the fear of complications, fainting, pain, needle prick and lack of time, others study inferred similar reasons for deferring blood donation.[28, 29]

Hepatitis B and C, HIV, Syphilis and Malaria remain the major challenges associated with blood transfusion.[30] The donors at times are also afraid of their status regarding these diseases. Estimates from the WHO in Pakistan suggested that 15.6% of the populations are carrier of Hepatitis. [31]

The results of this study suggest that there is a strong need to initiate donor recruitment programmes in the country, increasing the general awareness among the masses and especially the health providers.

Conclusion

In conclusion, the study showed that there are several factors that play role in motivating volunteers to donate blood. It is important to create and strengthen the donor recruitment strategies especially for younger generation. Nonetheless it is also essential to impart awareness to donors and non donors regarding the benefits of the blood donation and incentives can be planned for the retention of the donors.

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Placebo-Controlled Trial of Nebulization with Adrenaline in Acute Bronchiolitis: A Quasi-Experimental Study

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Abstract

Background
Bronchiolitis is an acute inflammatory obstruction of small airways in children that occurs in first two years of life and is characterized by fever, rhinitis, cough, tachypnoea, expiratory wheeze and increased respiratory effort.

Objective
To study efficacy of nebulized adrenaline compared with placebo in acute bronchiolitis.

Methodology
Quasi-experimental study carried out at Department of Paediatrics, King Edward Medical University/ Mayo Hospital, Lahore from October 2006 through March 2007. After consent from parents, sixty children of age between 2 months to 2 years with the first episode consistent with clinical case definition of bronchiolitis were included by using convenient sampling. Clinical scoring system was used to grade the severity of disease as well as to monitor the efficacy of intervention. Those having score =8 were randomly allocated to the two study groups. The information was recorded at 0 minute and effect of each method of treatment was followed for 90 minutes.

Results
Our study population was 60 children. The mean age was 11±6 months. Male to female ratio was 1.2:1. Mean weight of the children was 9±3 kg. Improvement in clinical score, oxygen saturation, and length of hospital at 0 and 90 minutes was noted in both groups but when compared with placebo, there was no statistically significant difference.

Conclusion
There is no difference in the efficacy of nebulization with adrenaline compared with placebo in the management of acute bronchiolitis.

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Key words
Acute Bronchiolitis, Adrenaline, Nebulization.

Introduction
Bronchiolitis is clinically characterized by fever, rhinitis, cough, tachypnoea, expiratory wheeze and increased respiratory effort.[1] Acute viral bronchiolitis is one of the most common causes of hospitalization during infancy with respiratory syncytial virus (RSV) being the major causative agent (85%).[2]

Globally, among healthy, full term infants, 80% of hospitalizations occur in the first year of life. Hospital admissions for bronchiolitis have almost doubled over the past 10-15 years in America.[3] In Pakistan, acute respiratory illness (ARI) is the leading cause of death in young children, responsible for 20-30% of all deaths under age 5 years.[4]

The treatment of infants with bronchiolitis is largely supportive.[5] The role of bronchodilators is contraversial.[3] As with older studies, most recently published randomized controlled trials (RCTs) have failed to demonstrate clinical efficacy of bronchodilators agents in bronchiolitis.[6,7] The objective of this study was to compare the efficacy of adrenaline with normal saline (as placebo) in the management of acute bronchiolitis.

Patients and methods
This study was conducted in the department of Paediatrics, King Edward Medical University/Mayo Hospital Lahore from October 2006 to March 2007. Sample was collected by convenient sampling technique. Consent was taken from parents and confidentiality was assured. Sixty children fulfilling our case definition, age between 2-24 months, having disease score = 8, according to scoring criteria, were included in the study. Table 1 shows clinical scoring system used to grade the severity of disease as well as to monitor the effect of treatment.[1] Children having score >8, and underlying cardiac disease were excluded from the study.

Children fulfilling inclusion criteria were randomly allocated to both the study groups. Duration of each nebulization was 10

Table 1: Clinical scoring system used to grade the severity of disease.

Score	Breath rate	Retractions (resp/min)	Nasal flaring during inspiration	Wheezing	General status
0	<30	No	No	No	Normal
1	30-45	Only intercostal	Mild and rarely	Heard only with stethoscope	Moderately uneasy and occasionally crying
2	45-60	Intercostal, subcostal and supraclavicular	Moderately seen and intermittently	Heard in both expiration and inspiration with stethoscope	Very uneasy, crying continuously
3	60	Abdominal respiration accompanying	Severe and continuously	Heard in both expiration and inspiration without stethoscope	Lethargic

minutes. Each nebulization solution was prepared in dilution with normal saline up to 3 ml quantity. Normal saline (placebo) was administered as 3 ml/dose, adrenaline with 0.5 ml/kg of 1:1000 diluted in normal saline to make it 3 ml solution/dose. Oxygen therapy was administered when O_2 saturation fell below 92%. The information was recorded at zero minute and effect of each method of treatment was followed for 90 minutes. The data was collected on a specially designed proforma. The data was entered into the SPSS version 13. Socio-demographic data was presented as mean and standard deviation. Clinical score, duration of oxygen and length of hospital stay were analyzed by applying ANOVA (One way Analysis of variant). p value =0.05 was considered significant.

Results

The study population consisted of 60 children. Mean age of children was 11±6 months. There was male predominance (55%) and male to female ratio was 1.2:1. Mean weight of the infants was 9±3 kg. Both the groups were comparable regarding demographic profile (Fig 1).

Total clinical score before the onset of treatment for placebo (normal saline) and adrenaline was 5.90±1.44 and 5.73±1.26 respectively while after therapy it was 2.13±0.97 and 2.13±0.78 respectively. Oxygen saturation before the onset of treatment for placebo and adrenaline was 92.77±2.88 and 92.87±1.87 respectively while after therapy it was 94.20±1.54, 93.97±1.65 respectively. Mean length of hospital stay for placebo group was 2.87±2.01 hours and for adrenaline was 2.80±1.86 hours. There was improvement in clinical score, oxygen saturation and length of hospital stay in individual groups but when group was compared with placebo, no statistically significant difference was observed (Table 2)

Discussion

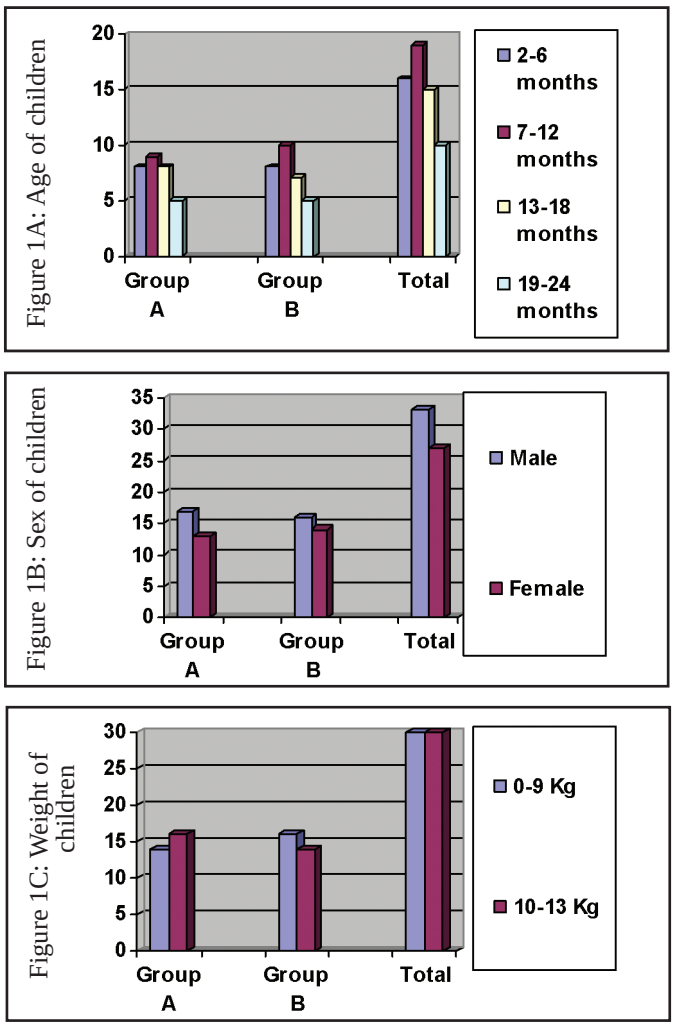

Figure 1: Distribution of cases by demographic parameters

Table 2: Effect of nebulization on clinical score, oxygen saturation & length of hospital stay (n=60)

Groups	n	Mean±SD	Mean±SD	*p* value
Effect of Nebulization on Clinical Score				
Normal Saline	30	5.90±1.44	2.13±0.97	1.00
Adrenaline	30	5.73±1.26	2.13±0.78	
Effect of Nebulization on Oxygen Saturation				
Normal Saline	30	92.77±1.88	94.20±1.54	0.57
Adrenaline	30	92.87±1.87	93.97±1.65	
Effect of Nebulization on Length of Hospital Stay				
Normal Saline	30	2.87±2.01		0.89
Adrenaline	30	2.80±1.86		

Acute bronchiolitis is one of the commonest lower respiratory tract infections in infants. Role of bronchodilators is controversial. Mean age of children in our study was 11.4±6 months, other studies have reported relatively younger age groups (6.9±3.4months, 5.4± 9.4months, respectively).[1,8] This difference may be due to small sample size in their studies. Male to female ratio of 1.2:2 with an overall male preponderance (55%) is in accordance with the studies by Uyan (58%) and Arif (68%).[1,8]

The severity of disease and improvement in clinical condition was accessed by applying clinical scoring system.[1] Present study noted improvement in clinical score at 0 and 90 minutes in each group but when compared with placebo, no statistically significant difference was found. Study by Mull *et al* also favored our results observing improvement in both treatment groups with similar pattern of change in mean clinical score in both the treatment groups but there were no significant differences between the groups by the same measure at any time.[9] However, randomized control trials (RCTs) have shown significant clinical improvement after nebulized adrenaline.[10] Kellner also found that adrenaline produces modest short-term improvement in clinical features of mild or moderately severe bronchiolitis.[11] Hartling *et al* also favoured epinephrine compared with placebo for clinical score.[12]

This study noted improvement in oxygen saturation at 0 and 90 minutes in each group but when compared with placebo no statistically significant difference was found between the groups. Our results are consistent with the findings observed by Mull *et al*.[9] However, two separate RCTs have shown improvement in oxygen saturation after nebulized adrenaline.[10]

Statistically insignificant difference for length of hospital stay between the two study groups in our study has also been reported by Wainwright *et al*.[6] However, Schindler in RCT observed lower hospital admission rates and earlier discharge with adrenaline.[10]

Our observation of no difference in the efficacy of nebulization with adrenaline compared with placebo has been supported by Schindler and Hartling *et al* concluded that adrenaline might be favorable compared with placebo for short-term benefits among outpatients of acute bronchiolitis.[10,12]

Present study had certain limitations, it relied only on clinical diagnostic criteria.

Conclusion

There is no difference in the efficacy of nebulization with adrenaline compared with placebo in the management of acute bronchiolitis.

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CASE REPORT

Disseminated Hepatosplenic *Candida glabrata* Infection in a Patient with Acute Myeloblastic Leukemia

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Abstract

A 31-years-old male diagnosed case of acute myeloblastic leukemia was admitted in Bone Marrow Transplant Center on 25th May, 2010. He had history of high grade fever for last three weeks associated with rigors and chills and on local examination there was an abscess on right arm in the biceps region just above the intravenous catheter site. Both liver and spleen were enlarged and tender. Abscess was aspirated with a wide bore needle and the specimen was sent to microbiology department, Armed Forces Institute of Pathology. Gram staining revealed yeast cells and later culture yield was identified as *Candida glabrata.* CT scan abdomen revealed enlarged spleen studded with small hypodense areas and small hypodense areas in both kidneys representing fungal infection. The isolate was found sensitive to amphotericin B and itraconazole. Patient was treated with liposomal amphotericin B for two weeks and later shifted to oral itraconazole. The patient was successfully treated for candida infection.

Introduction

Candidiasis is a fungal infection caused by the species of the genus *Candida*; predominantly by *Candida albicans.*[1] *Candida* species are ubiquitous fungi and most common fungal pathogens that affect human beings. *Candida* species are opportunistic pathogens that gain access to the circulation and deep tissues mostly via catheters among hospitalized patients of low immunity. Disseminated candidiasis is frequently associated with hepatosplenic infection or may involve single organ infection. Blood cultures are negative in up to 40-60% of patients with disseminated candidiasis. *Candida glabrata* and *C. albicans* account for approximately 70-80% of *Candida* species recovered from patients with Candidemia or invasive candidiasis.[2] Candidemia is fourth most common infection among immunocompromised patients[3]. *Candida glabrata* has gained importance because of increasing incidence worldwide, its association with fluconazole resistance in up to 20% of clinical specimens, and its overall decreased susceptibility to other azoles and polyenes.[4]

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Case report

A 31-years-old male was admitted in Armed Forces Bone Marrow Transplant Center on 25th May 2010. He was previously treated in 2003 at the same centre for acute lymphoblastic leukemia with a standard induction of 3x high dose methotrexate. In March 2010, diagnosis was changed to acute myeloblastic leukemia on complex karyotypic abnormalities. He was given induction of D3A7 for four weeks at Karachi but there was no recovery from neutropenia.

At admission he had history of high grade fever for three weeks associated with rigors and chills. On examination, there was an abscess in right biceps region just above the intravenous catheter site. Patient also complained of pain in left hypochondrium. Spleen was enlarged and tender. Liver was also enlarged and non-tender. CVP line was inserted and the patient was immediately put on IV tazobactum + cefaperazone and amikacin, but high grade fever persisted.

Ultrasonography abdomen showed enlarged spleen (18.2 cm) and liver (21.3 cm) with infiltrative disease process. Splenic abscess, mild pleural effusion and small pericardial abscess were also noted. CT scan abdomen revealed enlarged spleen studded with small hypodense areas (Fig 1) and small hypodense areas in both kidneys representing fungal infection. Scan also revealed bilateral pleural effusion, cardiomegaly and small pericardial effusion (Fig 2). Blood culture both for fungal and bacterial isolates was also performed but there was no yield.

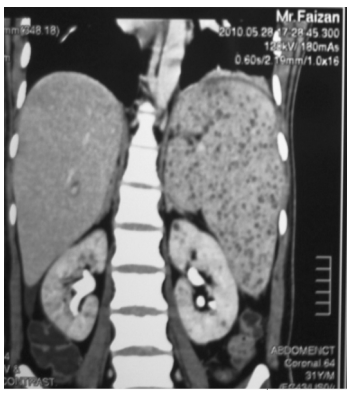

Figure 1: Tomogram of upper abdomen showing multiple small lesions in liver and spleen (horizontal view)

Abscess on right arm was aspirated with a wide bore needle, about 100mL was drained. The specimen was sent to microbiology department, Armed Forces Institute of Pathology. Gram stain of the smear showed numerous yeast cells (Fig 3). The specimen was inoculated on Blood Agar (Oxoid, UK), Mackonkey's agar (Oxoid), Sabouraud's dextrose agar (SDA) (Oxoid, UK) and SDA containing chloramphenicol (100mg per liter). Blood and MacConkey's agar were incubated at 37°C while SDA plates were incubated at 22°C. No bacterial growth was yielded, however growth started appearing on SDA next day. Pure cream coloured colonies were yielded from SDA. *Candida* species identification was done by using *Candida* Chromagar (DIFCO, USA) as purple coloured colonies[5]. Final confirmation was done by API 20c Aux (BioMerieux, France) identification system. Sensitivity test was done by E-test method[6].The isolate was sensitive to amphotericin B with MIC 0.5 µg/mL (MIC range 0.06-1) (Fig 4), itraconazole with 0.05 µg/mL (MIC range 0.03-0.5 µg/mL) and resistant to fluconazole with MIC 64 µg/mL (MIC range 8 - 32 µg/mL).

Patient was put on liposomal amphotericin-B, 3 mg per kg of the body weight and treatment was continued for two weeks and later shifted to oral itraconazole. The infection was successfully cured.

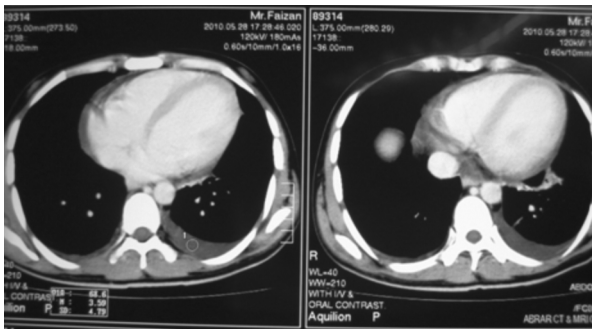

Figure 2: Tomogram of the chest showing pleural and pericardial effusion (Transverse view)

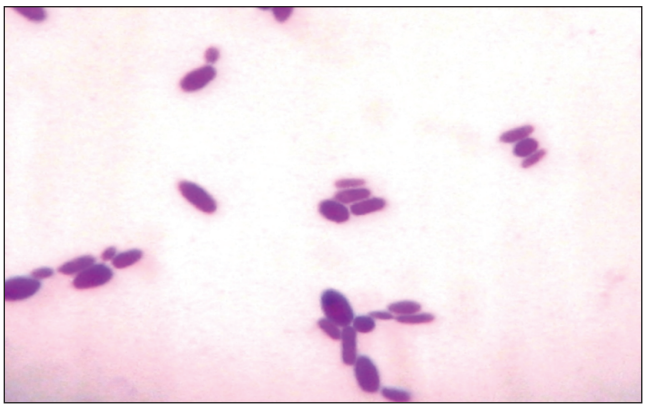

Figure 3: Gram stain showing Candida glabrata (magnification x1000)

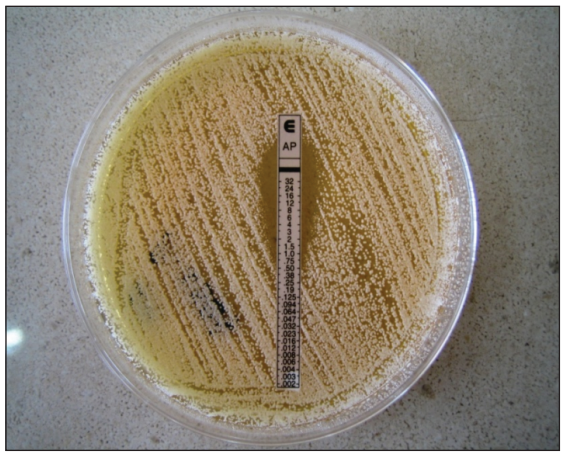

Figure 4: Sensitivity testing of Candida glabrata E-test method

Discussion

Chronic disseminated candidiasis is a rare condition seen in febrile neutropenic and immunocompromised patients but it has high potential for morbidity and mortality[7]. These infections have a poor prognosis mainly due to late diagnosis and scarcity of effective nontoxic antifungal drug. *Candida albicans* has been the most common (70-80%) isolate recovered from infected patients, *Candida glabrata* and *C. tropicalis* each account for approximately 5 to 8 % of isolates, while other non-albicans *Candida* species only rarely.[8] However, more recent epidemiological data revealed a mycological shift from *C. albicans* to the non-albicans *Candida* species such as *C. glabrata, C. tropicalis, C. parapsilosis*, and *C. krusei* [9].

The changing patterns and the increasing incidence of disseminated candida infection are also evident in a large autopsy series[10]. The high mortality rate associated with bacterial infections has declined with the early administration of empirical antibiotic therapy, while systemic fungal infections have become increasingly important in causing morbidity and mortality among immunocompromised patients. *Candida* has now become the fourth most common organism isolated from blood cultures among hospitalized patients [2].

Candida glabrata has recently emerged as an important nosocomial pathogen, yet little is known about its epidemiology. Relatively nonpathogenic nature of *C. glabrata* in animal models suggests that it has few virulence factors[11]. However, the cause of high mortality rate and the rapidity of the spread of disease are still unknown. The fact is that few studies have been conducted on virulence of *C. glabrata.* In contrast, *C. albicans* has several known virulence factors contributing to its pathogenicity that include adherence to epithelial and endothelial cells, hyphae and pseudohyphae formation[12].

Candida may involve any organ of the body, and candidemia has a diverse clinical picture, ranging from low-grade fever to

severe septic shock. There are no typical signs and symptoms in disseminated candidiasis including *C. glabrata*. The only manifestation often seen is persistent fever and deteriorating condition in a patient who is unresponsive to antimicrobial agents and has usually negative blood cultures. *Candida glabrata* fungemia has been associated with a higher mortality rate than *C. albicans*. A study conducted by Komshian *et al* reported 100% mortality in 12 patients with *C. glabrata* fungamia[13]. The higher mortality rate described by some investigators may not signify increase virulence of *C. glabrata* infection. In a more recent study, Fraser *et al* found no difference in mortality rates between *C. albicans* and *C. glabrata* [14]. Successful treatment of disseminated candidiasis has been previously reported.[15, 16]

Amphotericin-B has been the "gold standard" for treatment of systemic fungal infections including candidemia, despite having high adverse effects. Empirical therapy with amphotericin-B is especially indicated among neutropenic and immunocompromised patients having persistent fever after 3 to 7 days of antibiotic therapy, even in the absence of microbiological confirmation. This choice is especially justified as many researchers have documented the increase in the isolation of *C. glabrata* and *C. krusei* among neutropenic patients[17].

Invasive disseminated fungal infection should be diagnosed as early as possible in a patient undergoing immunosuppression, since early antifungal treatment may be life saving.

Candida glabrata is increasingly being recognized as pathogen in superficial and systemic candidiasis. A major issue among immunocompromised patients nowadays is the management of *C. glabrata* infections. Studies are required to find the risk factors and to know more about the virulence factors associated with the pathogenesis.

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Report on the 8th Annual Conference on Infectious Diseases, 11-12th March 2011

Infectious Diseases Society of Pakistan (IDSP) organized the 8th Annual Conference on Infectious Diseases in collaboration with International Society of Chemotherapy (ISC) and ERCON on 11-12th March 2011 in Islamabad with the theme "The Age of Superbugs; Facts and Solutions."

Preconference Interactive Workshops

The conference consisted of four workshops, "Antibiotics Use & Abuse in Common Infections," "Patient Safety in Hospitals," "Role of Nurses in Infection Control" and a special first time workshop in Pakistan "Modalities of Diagnostic Mycobacteriology".

These workshops were a resounding success with more than 350 participants. Moderators and experts conducted these workshops with active participation from the enthusiastic audience. All enjoyed the unique, hilarious and dramatized workshop on "Antibiotics Use & Abuse in Common Infections." Residents and students demonstrated the rampant misuse of antibiotics with role-plays about various aspects followed by key messages such as "SAY NO TO ANTIBIOTICS IN COMMON URIs". Many among the audience requested for similar workshop in future meetings as well. The "Modalities of Diagnostic Mycobacteriology" was similarly first of its kind in Pakistan with new rapid testing methodology for MTB was demonstrated with hands-on-experience for MGIT®, GenoType® MTBDR plus and GeneXpert®.

The General Body meeting was held in the afternoon that was followed by elections for new office bearers of IDSP. The new office bearers are:

President:	Dr Ejaz A. Khan (SIH)
General Secretary:	Dr Shehla Baqi (SIUT)
Treasurer:	Dr. Asim Beg (AKUH)

Scientific Session

The scientific sessions were held on 12th March 2011 at Margalla Hotel. Dr Asad Hafeez, DG Health was the chief guest at the inaugural session. A large gathering of professionals with different specialties including physicians, surgeons, ID specialists, microbiologists, public health experts, post graduates students and nurses attended. The simple ceremony was followed by plenary lectures and free paper sessions for the attendees.

Dr. Asad Hafeez, Director General Health, while addressing the conference said, "It is heartening that IDSP has been in the forefront of tackling infectious diseases issues in Pakistan. I am fully aware of the admirable efforts and events conducted by IDSP to enhance medical knowledge and clinical skills of medical practitioners, family physicians, infectious disease specialists, microbiologists and other medical and paramedical professionals. The Ministry of Health applauds the efforts of IDSP and will extend all possible help in such academic activities to build a strong and broad based private-public partnership."

Dr. Ejaz Khan, General Secretary IDSP and Chairperson of Organizing Committee, Consultant Pediatrician, Shifa International Hospital welcomed the attendees and pointed out while addressing the conference, "Microbes are on the hunt and being hunted. Over the last many years we have achieved significant milestones such as Rabies Awareness, Infection Control, Immunization Campaigns and Hand Hygiene among the school children", He also said, "Infectious disease is the single most cause that creates havoc among the population. This is to be tackled through awareness, followed by intervention."

Dr. Altaf Ahmed, President IDSP, Indus Hospital Karachi spoke on the burden of different diseases plaguing Pakistan and emphasized the urgent and consensus approach on war footing to address them. Dr. Altaf said that, "IDSP is holding its 8th Conference at Islamabad with the objective to discuss way forward to meet these challenges in Pakistan. The emergence of antibiotic resistance is further complicated by the fact that bacteria and their resistance genes are travelling faster and further. We are facing not only epidemics but pandemics of antibiotic resistance i.e., airlines carry passengers, worldwide distribution of foods, poor hygiene in hospitals and community, augmenting the rapid spread of antibiotic resistant bacteria is vulnerable in populations." He also said that, "This is an excellent opportunity to exchange information with both national and international experts."

The participating speakers for the conference were Prof. Kurt Naber, Assocociate Professor of Urology, University of Munich, Past-President ISC; Dr. Lars Kocherscheidt, Hain Lifescience GMBH, Hardwiesenstrass, Germany; Brig. Parvez Ahmed, Consultant Hematologist Armed Forces BMT Centre, Rawalpindi; Dr. Salman Siddiqui, Consultant Mycobacteriologist, USA; Prof. Naveed Khan, Chair, Department of Biological and Biomedical Sciences, AKU; Prof. Sajid Maqbool, Professor Emeritus, Children Hospital, Lahore; and Prof. Ashraf Sultan, King Edward Medical University/ Mayo Hospital, Lahore.

Free Papers

A total of more than120 abstracts were received and 30 papers were selected for oral and 36 papers for poster sessions. The free papers session included themes on "Tuberculosis", "Resistant Infections" and "Pediatric Infections". These sessions were well-attended and young researchers presented pressing problems in ID. An estimated 450 participants attended these sessions.

Dr. Shaukat Ali Bangash CEO, Quaid e Azam International Hospital, arranged a grand dinner for the delegates at QIH. He

showed facilities specially designed for isolation and catering for infections such as Hepatitis B and C, TB, Viral hemorrhagic fevers and others, keeping infection control measures in mind. The outgoing President IDSP Dr. Altaf was presented a souvenir and Ex-President IDSP Dr. Naseem Salahuddin praised his tireless efforts since last 4 years for ensuring that membership of IDSP was enhanced and organizing multiple other academic activities. Organizing Committee was appreciated for their dedicated and successful efforts in arranging the event.

A simple concluding ceremony was done at the end of the day. Mr. Hamdani presented souvnirs to different pharmaceutical companies, Event Manager Mr. Nisar Mirza, staff, volunteers and hotel management. Cash prizes of were given to three best posters by the "judges" Dr Kurt Naber, Dr Afia Zafar and Dr Faisal Sultan. On a happy note Dr. Ejaz A. Khan gave a vote of thanks for to the organizing committee, speakers, authors, volunteers, pharmaceutical companies and attendees. He announced that next IDSP conference would be held in Karachi with a special day for TB.

International Award

Dr Aamer Ikram, Editor IDJ has been awarded 'Biosafety Heroes Award' by International Federation of Biosafety Associations (IFBA). This is indeed an honour for the country. The ceremony was held in February in Bangkok, Thailand.

A B E--- Antibiotic Escalation / De-escalation table-in Jungle of Bugs / Drugs

Attiq-ur-Rehman, Nazar Ullah Raja

Shifa International Hospital, Islamabad.

	Gram Positive Cocci					Gram Negative Rods						Anaerobe		Others		
A : Anti microbes of Narrowest spectrum choice # 1, if ---? **A: Narrower than B spectrum, prefer to use, if possible** **B: Broad spectrum, Narrower than E.** **E: Extended , very Broad spectrum.**	**Streptococcus**	**Enterococcus**	**VRE**	**MSSA**	**MRSA--MRSE**	**AMP-Sensitive**	**AMP-Sensitive**	**AMP-Resistant**	**Cefazolin Resistant**	**Ceftriaxon Resistat**	**MDR**	**Non Bacteroid**	**Bacteroides**	**Atypicals**	**Rickettsia**	**Pneumocystis**
PENICILLIN	A	**A**	**A**	-	-	-	-	-	-	-	-	**A**	-	-	-	-
Ampicillin	**A**	**A**	**A**	-	-	**A**	**A**	-	-	-	-	**A**	-	-	-	-
Ampicillin-sulbactam	**B**	**B**	**B**	**B**	-	**B**	**B**	**A**	**A**	-	-	**B**	**A**	-	-	-
Piperacillin-tazobactam	**E**	**E**	**E**	**E**	-	**E**	**E**	**E**	**E**	**A**	**?**	**E**	**B**	-	-	-
CEPHALOSPORINS																
1st- Cefazolin	**A**	-	-	**A**	-	**A**	-	**A**	-	-	-	**B**	-	-	-	-
2nd- Cefotetan	**B**	-	-	**B**	-	**B**	**B**	**A**	**A**	-	-	**A**	**A**	-	-	-
3rd- Ceftriaxone	**B**	-	-	**B**	-	**B**	**B**	**A**	**A**	-	-	**A**	**A**	-	-	-
3rd- Ceftazidime	**?**	-	-	**?**	-	**B**	**B**	**B**	**B**	**A**	-	**?**	-	-	-	-
3rd- Cefoperazone-sulbactam	**B**	-	-	**B**	-	**E**	**E**	**E**	**E**	**A**	-	**A**	**A**	-	-	-
4th- Cefepime	**E**	-	-	**E**	-	**E**	**E**	**E**	**B**	**A**	-	**?**	-	-	-	-
QUINOLONES																
Ciprofloxacin	-	-	-	**?**	-	**B**	**B**	**B**	**B**	**A**	-	**?**	-	-	-	-
Levofloxacin	**E**	-	-	**E**	-	**E**	**E**	**E**	**E**	**A**	-	**?**	-	**A**	**?**	-
Moxifloxacin	**B**	-	-	**B**	-	**B**	**B**	**A**	**A**	-	-	**?**	**?**	**A**	**?**	-
AMINOGLYCOSIDES Gentamicin / Tobra / Amikacin	+	+	+	+	+	**B**	**B**	**B**	**B**	**B**	**?**	**?**	-	-	-	-
POLYMYXIN	**?**	**?**	**?**	**?**	**?**	**E**	**E**	**E**	**E**	**E**	**A**	-	-	-	-	-
Tetracyclines	**?**	**?**	**?**	**?**	**?**	**?**	**?**	**?**	-	-	-	**?**	**?**	**A**	**A**	-
Tigecycline	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	-	**A**	**E**	**E**	**?**	**?**	-
Clindamycin	**A**	-	-	**A**	**?**	-	-	-	-	-	-	**A**	**A**	-	-	-
Erythromycin	**A**	-	-	**A**	**?**	-	**A**	-	-	-	-	**?**	**?**	**A**	-	-
Trimetho-Sulfa (**No Strep. A**)	**B**	**?**	**?**	**B**	**B**	**A**	**B**	**B**	-	-	**?**	**?**	**?**	-	-	**A**
Metronidazole	-	-	-	-	-	-	-	-	-	-	-	**A**	**A**	-	-	-
Chloramphenicol	**B**	**B**	**B**	**B**	**?**	**B**	**B**	**B**	-	-	**?**	**A**	**A**	-	**A**	-
Aztreonam	-	-	-	-	-	**E**	**E**	**E**	**B**	**B**	**?**	-	-	-	-	-
Imi / Mero / Dori-penem	**E**	**E**	**E**	**E**	-	**E**	**E**	**E**	**E**	**B**	**?**	**E**	**E**	-	-	-
Vancomycin / Tiecoplanin IV	**A**	**A**	-	**B**	**A**	-	-	-	-	-	-	**B**	-	-	-	-
Linezolid IV & PO	**A**	**A**	**A**	**B**	**A**	-	-	-	-	-	-	**?**	-	-	-	-
Synercid IV	**A**	**A**	**A**	**B**	**A**	-	-	-	-	-	-	**?**	-	-	-	-
Daptomycin IV	**A**	**A**	**A**	**B**	**A**	-	-	-	-	-	-	**?**	-	-	-	-
? = Questionable coverage. **- = No coverage.** **+ = Coverage by synergy with other.** **Note: A, A , B , & E may be of equal efficacy.**	**Pneumococcus**	**Enterococcus**	**VRE**	**MSSA**	**MRSA--MRSE**	**Proteus**	**H-influenzae**	**Klebsiella**	**Enterobacter**	**P-aeruginosa**	**Acinetobacter**	**Non Bacteroides**	**Bacteroides**	**Atypicals**	**Rickettsia**	**Pneumocystis**

Instructions for Authors

Scope
The Infectious Diseases Society of Pakistan sponsors the Infectious Disease Journal of Pakistan (IDJP). The Journal accepts Original Articles, Review Articles, Brief Reports, Case Reports, Short Communications, Letter to the Editor and Notes and News in the fields of Microbiology, Infectious Diseases; with laboratory, clinical or epidemiological aspects.

Criteria for publication
All articles are peer reviewed by the IDSP panel of reviewers. Authors may also submit the names and contact information of two persons who potentially could serve as unbiased and expert reviewers for their manuscript, but IDSP reserves the right of final selection.

Submission of the Manuscript
Manuscripts must be formatted according to submission guidelines given below, which are in accordance with the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (originally published in N Engl J Med 1997; 336:309-15).

Please submit the manuscript and all enclosures to: The Editor, Infectious Diseases Journal of Pakistan, Department of Pathology, Combined Military Hospital, Quetta, Pakistan. Electronic copy of the manuscript must also be sent to maahin1@yahoo.com. All manuscripts submitted to IDJP must be accompanied by an authorship declaration stating that *'The authors confirm that the manuscript, the title of which is given, is original and has not been submitted elsewhere. Each author acknowledges that he/she has contributed in a substantial way to the work described in the manuscript and its preparation'*.

Manuscript Categories

Original Articles
Articles should report original work in the fields of microbiology and infectious diseases.

Title page
This should list title of the article, full names of each author with highest academic degree(s), institutional addresses and email addresses of all authors. Corresponding author should also be indicated with his/her name, address, telephone, fax number and e-mail address. A short running title of not more than 40 characters (including letters and spaces) be placed at the foot end of the title page.

Abstract
Abstract should not exceed 200 words and must be structured in to separate sections. Avoid abbreviations or citing references in the abstract.

Key Words
Four to five standard key words must be provided.

Introduction
The section must clearly state the background and importance of the research along with objectives.

Materials and Methods
Mention the place and duration of study. design of study and details of interventions used must be clearly described. Provide details of subject selection (patients or experimental animals). Details must be sufficient to allow other workers to reproduce the results. Identify precisely all drugs and chemicals used, including generic name(s) and route(s) of administration.

Results
Present results in logical sequences in the text, tables and illustrations. Articles can have a maximum of five illustrations (in a combination of figures and tables) per article.

Discussion
Emphasize important aspects of the study and compare with other studies. Do not repeat the details from the results section. Discuss the implications of the findings and their limitations. Link the conclusions with the goals of the study but avoid unqualified statements and conclusion not completely supported by your data.

Acknowledgments
Acknowledge any sources of support, in the form of grants, equipment or technical assistance.

Review Articles
Authoritative and state of the art review articles on topical issues are also published, with a word limit of 2000. These should be comprehensive and fully referenced. Articles should contain Abstract, main mext divided into sections, Conclusions and References.

Brief Reports
Short clinical and laboratory observations are included as Brief Reports. The text should contain no more than 1000 words, 2 illustrations or tables and up to 10 references.

Case Reports
Instructive cases with a message are published as case reports. Routine syndromes or rare entities without unusual or new features are invariably rejected. The text should contain no more than 1000 words and 2 illustrations or tables. The authorship should not exceed 4 persons.

Letter to the Editor
These may relate to material published in the IDJP, topic of

interest pertaining to infections diseases, and/or unusual clinical observations. A letter should not be more than 300 words, one figure and 3-5 references.

News and Views
Pertinent news and updates in infectious diseases from around the world (approximately 200 words).

Notices
Announcements of conferences, symposia or meetings may be sent for publication at least 12 weeks in advance of the meeting date. Details of programs should not be included.

References
Number references in the order in which they are first cited in the text. Label references in text, tables and legends by Arabic numerals (in superscript). References cited only in tables or in legends to figures should be numbered in accordance with a sequence established by the first identification of the particular table or illustration.

Write all authors, complete title, journal name (standard abbreviation in italics), year, volume, issue, page numbers according to "**Uniform Requirements of Manuscripts submitted to Biomedical Journals**", as cited in *N Engl J Med* 1997; 336:309-15.

Tables and Figures
Data reported either in a table or in a figure should be illustrative of information reported in the text, but should not be redundant with the text. Table should be numbered consecutively in Arabic numerals. Tables and Figures legends should be self-explanatory with adequate headings and footnotes.

Illustrations
Illustrations should be numbered and given suitable legends. If possible, figures should be submitted in electronic format as either a TIFF (tagged image file format) or JPEG format. Minimum resolution for scanned artwork is:

Black & White Illustration
- Line, e.g. graphs: 600 dpi
  Halftone, e.g. photographs: 300 dpi

Coloured illustrations: 400dpi (images should be split CMYK)

Ethical Guidelines
The research project must be reviewed by Ethical Committee of the institute. All clinical research articles/studies involving human subjects submitted to the IDJP must adhere to ethical guidelines of their institutions and have informed consent from their patients. All scientific research that uses animals in their study protocols must include a statement on the ethical treatment of animals during the study.

Financial support: Authors must disclose any financial support received during the course of the study.

Conflict of Interest: If there is any conflict of interest then this must be disclosed by the author(s) at the end of the article.

Plagiarism
Make sure that your article is not copied or reproduced. Plagiarism in research is a crime and the matter will be taken seriously.

Instructions updated - December 2010.
Editor IDJ

MEMBERSHIP APPLICATION FORM

INFECTIOUS DISEASES SOCIETY OF PAKISTAN

No. _____

Name

Mailing Address

Institute/ Organization

Department & Division

Field of Interest

Designation | PMDC No.

Phone No. Resdence | Office

Cell | E-mail

Degree/ Diploma:

☐ MBBS ☐ MD ☐ MSc Biological Scinec ☐ BSc Nursing
☐ MRCP ☐ MCPS ☐ FRCS ☐ FCPS
☐ MRCPath ☐ Ph. D ☐ M. Phil ☐ Pharma. D
☐ DCH ☐ Diplomat American Board of
Other

Application for member as

☐ Full Member (Annual/ Life) Rs.500 for 1 yr, Rs.3000/- for life
☐ Overseas Member US$.100/- for Life
☐ Associate Member Rs.500 for 1 yr, Rs.3000/- for life

Signature Date

For Office Use Only

Approved/ Not Approved

Membership No: _____ Reference No: _____

Comments: _____

Signature General Secretary: _____

FULL MEMBERSHIP:

Should be at least medical graduates registered with PMDC and having postgraduate qualification in any field.
Full member may be

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2. Annual: with 1 year fee of Rs.500/-

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All the members shall have the right to:
1. Participate in all activities of the society.
2. Receive all publication including quarterly ID Journal free of cost.
3. Vote according to constitution of the society.

ASSOCIATE MEMBERS:

All the members shall have the right to:
1. Participate in programs of the society.
2. Receive all publication including quarterly ID Journal free of cost.

Please send your Application form by hand or by mail only.
Membership fee will only be received in cash/ cross cheque/ pay order or bank draft made out to Infectious Disease Society of Pakistan.

Mailing Address and Contact Nos:

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