## CONTENTS

<table>
<thead>
<tr>
<th>PAGE #</th>
<th>INFECTIOUS DISEASES JOURNAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Infectious Diseases Journal of Pakistan**

Official Organ of the Infectious Diseases Society of Pakistan

President: Altaf Ahmed
Consultant Microbiology, The Indus Hospital
Karachi, Pakistan

Gen. Secretary: Ejaz A. Khan
Department of Pediatrics,
Shafa International Hospital, Islamabad, Pakistan

Treasurer: M. Asim Beg
Pathology & Microbiology,
Aga Khan University, Karachi, Pakistan

Editor: Aamer Ikram

Editorial Board

- Naseem Salahuddin: Karachi
- Naila B Ansari: Karachi
- Shehla Baqi: Karachi
- Nural Iman: Peshawar
- Ejaz Khan: Islamabad
- Ayesha Khan: Islamabad

Overseas Advisers:

- Murat Akova: Ankara,Turkey
- Rayhan Hashmy: UAE
- Deborah Briggs: U Kansas, USA
- Peter Chiodini: Royal College Trop Med/Hyg UK
- Salman Siddiqui: USA
- Aedel Butt: U of Pittsburgh, USA
- Farida Jamal: KL, Malaysia

Business and Circulation

Nasir Hanook

Rights:

No part of this issue or associated program may be reproduced, transmitted, transcribed, stored in a retrieval system or translated into language or computer language in any form or means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise without the express permission of the editor/publisher and author(s) of IDJ.

Disclaimer:

Statements and opinions expressed in the articles, news, letters to the editors and any communications herein are those of the author(s), the editor and the publisher disclaim any responsibility or liability for such material. Neither the editor nor publisher guarantee, warrant, or endorse any product or service advertised in their publication, nor do they guarantee any claim made by the manufacturers of such product or service.

Frequency:

Infectious Diseases Journal (IDJ) is published quarterly.

**Recognised and registered with the**

**Pakistan Medical & Dental Council**

NO.PF.11-F-96 (Infectious Diseases) 2560

**College of Physicians & Surgeons, Pakistan.**

**Higher Education Commission, Pakistan**

Indexed - **WHO EMRO**

---

**Price:** Rs. 100
Editorial required
Editorial required
Thrombocytopenia and Benign Tertian Malaria

*Combined Military Hospital, Kohat
**Armed Forces Institute of Pathology

Abstract

Objectives
To determine the effects of benign tertian malaria on platelets count.

Place and Duration of Study
The study was conducted at department of medicine, Combined Military Hospital, Kohat, from 31st January to 30th July 2008.

Patients and Methods
One hundred patients of BT malaria and patients with acute febrile illness having strong suspicion of malaria ranging in age ≥ 15 yrs admitted to medical unit, Combined Military Hospital Kohat were included in this study. Patients with presumptive diagnosis of malaria based on clinical features (high grade fever of < 7 days duration with rigors and firm splenomegaly) were selected. Blood smears for malarial parasite were examined by a consultant pathologist to confirm the absence or presence and type of malarial parasites and were taken as gold standard for the diagnosis of benign tertian malaria. Platelet counts were performed on automated haematology analyzers.

Thrombocytopenia was defined as mild (Platelet count: 50-150x10^3 cells/uL), moderate (20-50x10^3 cells/uL) and severe thrombocytopenia (<20x10^3 cell/uL).

Results
Out of 100 patients, 80% were males and 20% were females. Mean age for was 28 years. Out of 57 positive patients for malaria parasite on blood smear examination, 51 (89%) had thrombocytopenia while 6 (11%) had normal platelet count. In 43 patients negative for malarial parasite, 17 (40%) had thrombocytopenia while 26 (60%) cases had normal platelet count. Among patients with positive BT rings (n=57), 39 (68.4%) had mild thrombocytopenia, 10 (17.5%) had moderate, and 2 (3.5%) had severe thrombocytopenia. In this group, 6 patients (10.5%) had normal platelet count. In BT negative patients with thrombocytopenia all 17 patients (100%) had mild thrombocytopenia.

Conclusion
High incidence of thrombocytopenia was a common hematological finding in patients with Plasmodium vivax infection. The presence of thrombocytopenia in a patient with acute febrile illness increases the probability of malarial infection in endemic areas and may increase suspicion of malaria in settings where technical laboratory support is not available.

Key words
Benign tertian malaria, Thrombocytopenia

Introduction
Malaria is a major cause of ill health in many tropics and subtropics regions. 300-500 million cases of malaria occur annually resulting in over 1 million deaths each year. Prompt and accurate diagnosis is key to effective management. Clinical diagnosis may be unreliable because the presentation is diverse, and in tropical countries it may be difficult to distinguish it from viral fever, enteric fever, arboviral infections or even leptospirosis. Microscopy is still regarded as the "gold standard" and is used by most laboratories all over the world. This method may be problematic since interpretation of results requires expertise, particularly at low parasite levels.

A variety of haematological alterations like progressively increasing anaemia, thrombocytopenia and leucopenia have been reported in malaria. Thrombocytopenia is considered less common in patients with Plasmodium falciparum, however, in BT malaria marked thrombocytopenia even requiring platelets transfusion has been documented. DIC has also been reported in Plasmodium falciparum malaria. Similarly minor liver profile dysfunctions are reported in benign tertian malaria.

The influx of febrile patients with suspicion of malaria in our hospital, CMH Kohat is approximately 20 to 30 per month. Many of these patients are given anti-malarial empirically. Therefore if we establish a strong correlation between thrombocytopenia and positive peripheral blood films of malaria, we may be able to avoid unnecessary morbidity of patients due to its complications, laboratory expenditure and lessen the hospital stay of patients. This was the primary reason for conducting this study.

Materials and Methods
After approval by hospital ethical committee this study was conducted at Combined Military Hospital, Kohat. One hundred patients of acute febrile illness with presumptive diagnosis of malaria based on clinical features (high grade fever of < 7 days
duration with rigors and firm splenomegaly) were admitted through emergency and medical out patient clinic in medical unit. Those with significant co-morbid conditions like congestive cardiac failure, chronic renal failure or chronic liver disease, patients taking any medicines known to affect blood parameters, patients with mixed BT and MT infection, patients with history of thrombocytopenia and unwilling patients were excluded from the study. Thick and thin blood films for malaria parasite were prepared using Giemsa for thick film and Leishman’s stain for thin film and examined by a consultant pathologist to confirm presence and type of malarial parasites and were taken as gold standard for the diagnosis of benign tertian malaria. Blood samples were simultaneously sent to laboratory for determining platelet counts using Sysmex automated haematology analyzer. Thrombocytopenia was defined as mild (platelet 50-150x10^3 cells/μL), moderate (20-50x10^3 cells/μL) and severe (<20x10^3 cells/μL).

**Results**

Out of hundred patients, eighty were males and twenty were females. Their mean age was 28.2 years (range 15-76). Mostly patients belonged to middle and lower socioeconomic group. 57% patients were found to be positive for malarial parasite on blood film. Among 57 positive patients, 51 (89%) had thrombocytopenia while 6 (11%) had normal platelet count (Table 1). Mean platelet count was 84.20+40.2x10^3 cells/μL. Out of 43 cases which were negative for malarial parasite, 17 (40%) had thrombocytopenia while 26 (60%) cases had normal platelet count.

Among patients with positive BT rings (n=57), 39 (68.4%) had mild thrombocytopenia, 10 (17.5%) had moderate, and 2 (3.5%) had severe thrombocytopenia. In this group 6 patients (10.5%) had normal platelet count (Fig 1). Among BT ring negative patients only 17 had mild thrombocytopenia (Table 2).

**Discussion**

In chloroquine resistant era, early identification and treatment of malaria is imperative to decrease the unnecessary morbidity associated with the disease, hence indicators e.g. thrombocytopenia (decreased platelet count) can be used as predictor of disease. Presence of such an indicator may heighten the suspicion for malaria, prompting a more diligent search for the malarial parasite, and timely institution of specific therapy.

Thrombocytopenia in malaria patients, in contrast to the non-thrombocytopenia, correlates with higher degree of parasitemia and increased cytokine production. This association of thrombocytopenia with BT malaria was documented in an Indian study (2004); out of 184 patients, 70 (38%) had positive peripheral smear for malarial parasite. Thrombocytopenia alone (platelet countless than 150,000/mm^3) was a predictor for malaria (Sn 60%, Sp 88%, LR+ 5.04) and in combination with anaemia (Hb <10 g/dL) it was next best parameter (Sn 69%, Sp 74%, LR+ 2.77). RDW and leukocyte count were not predictive.

In a previous study conducted at JPMC Karachi, among 124 patients of MP positive, 100 (80.6%) were found to have thrombocytopenia. Overall 64 patients had P. falciparum, while 60 patients were having P. vivax infection. The frequency of thrombocytopenia was 71.87% (n=46) in P. falciparum and 93.33% (n=56) in P. vivax infection. It concluded that thrombocytopenia was a common haematological finding in patients with Plasmodium infection particularly marked in vivax species.

In Pakistan, capability of a routine CBC is available at all district-level hospitals. Interestingly, diagnosis of malaria at these hospitals is somewhat less accurate than at malaria clinics because of reliance on thin blood films or the limited experience...
of laboratory technicians with thick smear. Often patients presenting to district hospitals often have prior self-treatment with ineffective or sub-therapeutic doses of anti-malarials. Such treatment may suppress the parasites or distort morphology, but may not fully eliminate them. Therefore, in malaria-endemic area, an acutely febrile patient with low platelet count and a reduced WBC count, irrespective of smear report, should always be thoroughly re-evaluated for malaria.

There have been two important limitations; firstly the spectrum bias of a referral hospital could have contributed to more severe cases being included in the study. This could have resulted in a greater proportion of patients with thrombocytopenia in our study, as compared to the patients who would present to the primary care physicians. Secondly most patients received empirical anti-malarial treatment prior to hospitalization, which could be responsible for a greater proportion of false negatives in our study. Clearance of parasitaemia, as well as resolution of thrombocytopenia could have occurred after therapy. Other confounding factors for thrombocytopenia in acute fevers are sepsis and viral fevers, but a strong association of platelet count less than 150,000 in patients with slide positive malaria, as compared to the others, argues for recognition of thrombocytopenia as an important parameter which may be associated with malaria, its complications and even response to therapy. Larger studies should be undertaken to establish its role as an indicator of response to therapy.

The present study demonstrates that low platelet count is the haematological variable that increases the probability of malaria in patients presenting with acute febrile illness. The low platelet count emerged as a predictor of malaria, though is not diagnostic in patients presenting with acute febrile illness. The low platelet count, elevated aminotransferase and malaria infection may be used in addition to the clinical and microscopic parameters to heighten the suspicion of this disease, and prompt initiation of the therapy.

**Conclusion**

Presence of thrombocytopenia in a patient with acute febrile illness in the tropics increases the probability of malaria. This may be used in addition to the clinical and microscopic parameters to heighten the suspicion of this disease, and prompt initiation of the therapy.

**References**

Incidence and Diagnosis of Typhoid/Paratyphoid Fever in Karachi

Shamsul Arfin Qasmi*, Aqeel Ahmed**, S. Saud Hasan Zaidi***, Owais Ahmed****

* KESC Medical Center, ** University of Karachi, ***Dow University of Health Sciences, ****Main Laboratory JPMC, Karachi.

Abstract

Objective
Study was designed to evaluate incidence of Typhoid/Paratyphoid fever in Karachi and to determine comparative assessment of different tests available in the market so as to ascertain there reliability and authenticity.

Place and duration: Samples were collected from multiple clinical settings in slum settlements in Karachi and other socio-economic groups from June 2005 through 2007.

Material and Methods
Cases of high grade fever for three or more days were screened for typhoid clinically and blood culture, Typhidot test, Widal and complete blood counts were done.

Results
Of the 5106 cases with febrile episodes of three or more days in the community screened, 451 (8.8%) were clinically suspected of having typhoid fever. Sixty two (14.9%) were positive by blood culture whereas 212 (51.1%) were positive by serology.

Conclusion
The study emphasizes on development of new diagnostic test with more reliability than available serological tests. The different factors which affect the clinical expression of this fever should be addressed to overcome the challenges which it is posing in our community.

Key Words: Blood Culture, Typhoid fever, Widal test, Typhidot.

Introduction
Typhoid fever caused by Salmonella typhi remains an important public health problem in this country where clean water supply and sanitation are still much below requisite standards. It is a multi-system septicemic febrile illness where the portal of entry of the causative organism is the gastrointestinal tract. Typhoid fever is rare in developed countries, but remains one of the most prevalent acute infectious diseases in sub-continent due to improper sanitation and low socio-economic status. Several studies have shown that on an average more than 6,00,000 cases of typhoid fever occur every year in this region only1. The morbidity of typhoid fever is highest in Asia with 93% of global episodes occurring in this region. Southeast Asia has an estimated incidence of 110 cases per 100,000 populations which is the third highest incidence rate for any region. There is also a considerable seasonal variation of typhoid fever, carrying significant public health importance. Population based data in Pakistan is scarce.

The disease presents a clinical dilemma because of its varied manifestations and serious complications. Early rapid detection and identification of the etiological agent, Salmonella typhi, is essential in diagnosis and for treatment to reduce morbidity and mortality. The definitive diagnosis of the disease requires the isolation of Salmonella typhi from the blood, faeces, urine or other body fluids. Blood culture is generally recognized as the best procedure for definitive diagnosis of early typhoid fever. Positivity is less than 35-40% even in well equipped laboratories2.

The classic Widal test measures antibodies against O and H antigens of S. typhi and is more than 100 years old. Although robust and simple to perform, this lacks sensitivity and specificity, and reliance on it alone in areas where typhoid is endemic may lead to over diagnosis.

Typhidot test directly detects IgG and IgM antibodies against a host of specific S. typhi antigens and has been proved to be reliable to some extent in large scale evaluations in community settings3.

Despite the availability of these tests the diagnosis of typhoid in much of the developing world is made on clinical criteria. This poses problems, since typhoid may mimic many common febrile illnesses. Keeping in view all these factors this study was designed to have an evaluation of the incidence and to determine comparative assessment of different tests available in the market to ascertain their reliability and authenticity to correctly diagnose the disease and as such to focus our efforts to reduce the disease or morbidity burden in the communities.

Material and methods
From June 2005 to 2007 requisite samples were collected from multiple clinical settings in slum settlements and other socio-
economic groups in Karachi. Cases of high grade fever of three or more day’s duration were registered. Proformae regarding general details like age, sex, socioeconomic class were recorded for descriptive statistics. These patients were examined clinically.

Blood samples were collected using aseptic techniques. These were transported immediately to testing laboratories. Sample for blood culture was taken in Brain Heart Infusion (Oxoid, UK). It was tried that the blood culture specimen should be taken before starting any antibiotics.

Blood culture, Typhidot test, Widal and complete blood counts (CBC) were done using recommended standards methods. These parameters were expected to help us in evaluating a comparative efficacy and viability.

Results
Of the 5106 cases with febrile episodes of three or more days screened, 451 were clinically suspected of having typhoid fever. Sixty two were positive by culture whereas 212 were positive by serology. Incidence of culture proven typhoid was estimated to be less then serological based incidence. Peak incidence was noted in July and August followed by March and April.

Total cases registered with complaints of fever were 5106; however the cases with fever for 3-4 days were 451 (Table 1).

It was revealed that on blood culture examination, regarded as gold standard for the diagnosis of typhoid fever, percentage was quite low in comparison to classic Widal and Typhidot which are based on serological methodology (Figure 1). In addition we also found out that there was leucopenia and to some extent thrombocytopenia in certain cases.

Out of the total cases with fever 65.5% were male patients. Age wise children were more affected than other age groups (Table 2); susceptibility of this group was higher due to the unhygienic eating habits.

Table 3 shows the distribution of positive cases according to different socio-economic groups. It was found out that the low income group was afflicted more than lower middle class, middle class and upper middle class.

Discussion
Typhoid fever is among the most common febrile illnesses encountered by practitioners in developing countries. The advent of antibiotic treatment has led to a change in the presentation of typhoid, and the classic mode of presentation with a slow and stepladder rise in fever and toxicity is rarely seen. However, rising antimicrobial resistance has been associated with increased severity of illness and related complications.

The presentation of typhoid fever may be altered by coexisting morbidities and early administration of antibiotics. In areas where malaria is endemic and is common the presentation of typhoid may be atypical. The scientific investigation and practical implication during this project has helped with regards to data related to typhoid fever in our community that would facilitate preventive measures in this respect as previously reported.

In this study, we tried to focus on the pattern of spread of infection and in this regard collected samples from different localities starting from slum settlements to colonies and catchments area where various socio-economic groups were
residing from lower middle class to upper middle class. The incidence rate was found to be comparatively more in lowest socio-economic group as compared to other groups who have access to basic amenities like water, electricity and proper drainage lines and have somewhat improved sanitary conditions in their residential areas.

Blood culture yield was low. This is definitely due to the fact that most of the patients have habit of self-medication usually early in the course of disease, or other reasons like improper collection or timings. The general awareness among the masses needs to be enhanced in this regard. However, a higher percentage of positive serological tests proved to be helpful in diagnosis of typhoid fever with leucopenia in many serological positive cases further augmenting the classical diagnosis of Typhoid fever. The interpretation of various clinical and laboratory findings are according to the generally accepted insights and standard. Nested polymerase chain reaction has been used to amplify specific genes of S. typhi in the blood of patients and seems to be a promising means for making rapid diagnosis.

**Conclusion**

It was concluded that children and Low socio-economic group are more afflicted with this infection with peak incidence during hot and humid months, and Typhidot test seems to be helpful. We emphasize on development of new diagnostic test with better reliability. We need to provide basic amenities in catchments areas where this disease has greater impact and to improve general hygiene and sanitary conditions, educate masses to reduce the morbidity and economic burden. Regular Typhoid immunization must be made part of EPI.

**References**

The Prevalence of *Toxoplasma* IgG and IgM in Pregnant Women Residing in Rawalpindi.

Nighat Kausar*, Qanita Fahim**, Shamim Akhtar***, Aamer Ikram****, Mamoona Mushtaq*****

* Arid Agriculture University Rawalpindi
** Military Hospital Rawalpindi
*** Armed Forces Institute of Pathology Rawalpindi

Abstract

**Objectives**
To determine the prevalence of *Toxoplasma gondii* antibodies (IgG/IgM) among pregnant women visiting Military Hospital Rawalpindi and to develop a relationship between various risk factors and disease prevalence.

**Methods**
One thousand pregnant women reporting in out patient Gynaecology department of Military Hospital (MH) Rawalpindi from October 2008 through January 2009 for antenatal check up were included in the study. Their serum samples were tested for the presence of Toxoplasma IgM and IgG immunoglobulins. Enzyme Linked immunosorbant assay test kits for both IgG and IgM were used to detect *T. gondii* immunoglobulins in serum samples. Rest of the serum was stored at –20°C.

**Results**
Of the 1000 women sampled at hospital, 46 (4.6%) had evidence of past infection and were seropositive for immunoglobulins of *T. gondii* IgG, while none of them were seropositive for IgM immunoglobulin, suggesting absence of recent infections during pregnancy.

**Conclusion**
In twin cities of Islamabad and Rawalpindi, the seroprevalence of *T. gondii* IgG in pregnant women is relatively high (4.6%) as compared to other areas nearby. Consequently, the risk of primary infection during pregnancy and the potential for congenital infection of foetus remains there as a large no of pregnant women were sero-negative for both the antibodies.

**Key Words**
*Toxoplasma gondii*, Toxoplasmosis, Sero-prevalence

**Introduction**
*Toxoplasma gondii* is a responsible for Toxoplasmosis. Its primary host is the felid (cat) family. Toxoplasmosis is transmitted through oocysts shed in infected cats’ faeces. Humans acquire infection through three possible routes; eating infected meat, ingestion of food contaminated with of a that has itself recently been infected, or by vertical transmission (from mother to fetus). Factors like geographic, climatic, hygienic, socioeconomic conditions, and the life style of the population also increase the possibility of an individual for acquiring the infection and are responsible for high prevalence of antibodies in human populations.

During the first few weeks, the clinical features resemble mild-likelike symptoms or no illness in healthy individuals. However, it can occasionally be fatal in people with a weakened as or women. The parasite can cause encephalitis, neurological diseases, affects the heart, liver, and eyes.

Toxoplasmosis is monitored by examining serological levels of IgG, IgA, and IgM antibodies using the enzyme linked immunosorbant assay (ELISA) method, indirect haemagglutination test (IHAT) and indirect immunofluorescent antibody. Brain scan of foetus or isolation of the parasite from CSF in mice or cell culture is more reliable methods. Molecular techniques like polymerase chain reaction (PCR) can detect parasite directly from the specimen but the problem is that *T gondii* is rapidly cleared from the circulation by the immunocompetent host. Spontaneous abortion has been associated with maternal transmission of *T. gondii* to the fetus.

Screening for toxoplasmosis is made easy by detecting the persistence of the IgG or IgM antibody response. Like most other infections, the predominant early response is IgM antibody, which then dwindles to undetectable levels within a few weeks. After primary *T. gondii* infection, IgG remains positive for many months or even years. Antenatal screening programme in pregnant women would therefore need to include tests for IgM antibody only. Presence of IgG antibody in pregnant lady does not pose any problem of congenital toxoplasmosis to the foetus in whom primary infection occurred long time before conception.

The aim of this study was to determine the prevalence of toxoplasma antibodies both IgM and IgG by ELISA among pregnant women reporting for antenatal check up in Gynaecology Deptt at MH Rawalpindi and to develop a relationship between various risk factors and disease prevalence.
Materials and Methods
One thousand pregnant women reporting in outpatient Gynecology department of MH Rawalpindi for antenatal check up from October 2008 through January 2009 were included in the study. For the detection of toxoplasma IgM and IgG, approximately 5 mL of blood was aseptically drawn by venipuncture into a plain tube without anticoagulant and refrigerated overnight at 4°C. It was then centrifuged and serum harvested. Enzyme Linked immunosorbant assay (ELISA) test kits (Diamedix, Miami, Florida, United States of America) including serum controls, for both IgG and IgM were used to detect T. gondii immunoglobulins. Rest of the serum was stored at –20°C for any further testing. Additional data relevant to various risk factors associated with the disease was collected from patients on prescribed questionnaire.

The ethics committee of the hospital approved the study prior to commencement. The objectives and protocol for the study were explained to all the participants and written consent was obtained from all the patients.

Data were processed using the Statistical Package, version 14 (SPSS Inc., Chicago, Illinois, United States). Additional data relevant to various risk factors associated with the disease such as age, race and presence of cats in household, handling cat litter, outdoor gardening and habit of undercooked meat ingestion or unwashed/unpeeled vegetables was collected from patients on prescribed questionnaire and were tested for significance using the Chi-square test. Results of serum sample were also entered and tested.

Results
Of the 1000 pregnant participants, 46 (4.6%) were positive for IgG antibodies, while none of them were seropositive for IgM antibodies.

In most of the patient with positive IgG antibodies for toxoplasma, abortions had been occurred (39%) but the number of abortions was different in different patients. High sero-prevalence of antibodies points towards close association of patients with the risk factors like cats in vicinity (27%), while hygienic conditions, spring water, tap water and uncooked meat showed less association (20%) (Figure 1).

According to our study high sero-prevalence of Toxoplasma IgG antibodies was observed in pregnant ladies from Rawalpindi and Islamabad (9% and 11% respectively) as compared to Chakwal, Gujar Khan, Kallar Syedan and Kashmir (Figure 2). In our study, all patients positive for IgG (n = 46) were negative for IgM antibodies. The sero-prevalence of Toxoplasma IgG antibodies is inversely related with age and high sero-prevalence is noted in younger age group 25-30yrs (Figure. 3).

Discussion
Congenital transmission, prenatal mortality and abortion, are major problems in most countries with high prevalence of T. gondii infection. The sero-prevalence rate 4.6% detected for past exposure in the current study is not consistent with the previous studies like 60.4% Turkey, 74.5% Brazil, and 75.4% Nigeria. Pregnant women with pre-existing infection by the pathogen, often acquired during childhood, are unlikely to

---

**Fig. 1:** Prevalence of Toxoplasma gondii IgG antibodies in pregnant women and risk factors involved.

**Fig. 2:** Prevalence of Toxoplasma IgG antibodies in pregnant women according to native area.

**Fig. 3:** Prevalence of Toxoplasma IgG in pregnant women of different age groups.
transmit the infection to their fetuses during pregnancy due to the long term persistence of IgG[15,16]. It has been established that acquisition of primary infection during pregnancy, as detected by seroconversion (i.e., seronegative in first trimester and becoming seropositive (IgG) in subsequent trimesters) or production of IgM, has the potential to cause congenital infection in children and clinical symptoms, such as abortion, stillbirths, mental retardation, and eye problems[16,17,18].

Although cats are the primary source of oocysts that cause human and livestock infections[15,19,20], in our study, household cats or handling of cat litter were found to be second most significant factor associated with exposure to T. gondii infection in pregnant women. The finding correlates with earlier reports from Trinidad and Tobago[27] and elsewhere[22,23], but differs from the findings of Weiss and Kravetz et al[19,20,24]. Similarly, outdoor gardening and farm work did not significantly affect occurrence of toxoplasmosis, contrary to reports by others that these are independent risk factors for infection[22,25,26].

Our study showed exposure to T. gondii occurred at younger age which was not the case in earlier studies[27]. In twin cities of Islamabad and Rawalpindi, the seroprevalence of T. gondii IgG in pregnant women is relatively high (4.6%) as compared to other areas nearby. Pre-exposure of pregnant women to Toxoplasma and formation of IgG in serum serves as preventive element against toxoplasmosis in newborns. Consequently, the risk of primary infection during pregnancy and the potential for congenital infection of foetus remains there as a large no of pregnant women were sero-negative for both the antibodies.

It is, therefore, imperative that educational programs be launched to create awareness among the public as well as among health personnel, and stress for prenatal screening of toxoplasmosis.

References

22. Cook AJC, Gilbert RE, Buffaloano W, Zufferey J, Petersen E, Jenum PA, Foulon N, Semprini AE, Dunn DT. Sources of Toxoplasma infection in
The salient hematological laboratory features include thrombocytopenia and leucopenia. Other parameters include increased prothrombin time that explains the cause and severity of the hemorrhage associated with the disease, and raised levels of ALT are also observed.

The laboratory findings are very important as they provide a good index of severity of the disease and can be performed in any primary to tertiary care hospitals. It reflects the course of disease because it is seen that their levels fluctuate along with the signs and symptoms of the disease making them important screening and surveillance tools.

The objective of our study was to evaluate whether leucopenia and thrombocytopenia are true representative of screening/suggestive of dengue fever.

Material and Methods
One hundred and six patients were enrolled. Consecutive patients with acute non-specific febrile illness of less than two weeks duration presenting at Shifa International Hospital were selected. We did complete blood count examination and dengue serology for all enrolled patients.

Results
Dengue viral serology was reactive in 38(35.8%) patients, weakly reactive in 30(28.3%) patients and non-reactive in 38(35.8%) patients. Our study reported thrombocytopenia in 89% and leucopenia in 47% of patients positive for dengue serology.

Conclusion
In conclusion thrombocytopenia carries value in screening/suggesting dengue fever. Therefore patients presenting with acute febrile illness and having thrombocytopenia should be screened for dengue viral serology, moreover it will be cost effective in areas where dengue serology is not readily available for people with low socio economic status.

Key Words
Dengue Fever, Thrombocytopenia.

Introduction
Dengue fever, over the span of time has become a very important arthropod borne arboviral viral disease. The clinical types vary from fever with myalgias, headache and vomiting to severe hemorrhagic type with severe epistaxis, petechiae and mucosal bleeding. Dengue fever is important to rule out as clinically it is worst among other febrile illnesses.

The salient hematological laboratory features include thrombocytopenia and leucopenia. Other parameters include increased prothrombin time that explains the cause and severity of the hemorrhage associated with the disease, and raised levels of ALT are also observed.

The laboratory findings are very important as they provide a good index of severity of the disease and can be performed in any primary to tertiary care hospitals. It reflects the course of disease because it is seen that their levels fluctuates along with the signs and symptoms of the disease making them important screening and surveillance tools.

The objective of our study was to evaluate whether leucopenia and thrombocytopenia are true representative of screening/suggestive of dengue fever.

Materials and methods
This study was carried out at Shifa International Hospital from August 2008 through July 2009. The internal review board reviewed the proposal and the ethics committee of Shifa College of Medicine approved the study. One hundred and six consecutive patients presenting with acute non-specific febrile illness of less than two weeks duration were selected. We did complete blood count examination (CBC) and dengue serology for all enrolled patients.

The samples were drawn in the hospital and were processed in Haematology Section, Shifa International Laboratory. CBC was performed on Celldyne 3700 hematology analyzer, whereas Dengue viral serology was performed on ELISA (Diagnostic Automation, INC Immunodiagnostics, Microwell Dengue IgM-USA). Controls were run before each sample batch. Thrombocytopenia was defined as platelet count below 150 x10^9/L and leucopenia as white cell count below 4000/cumm. Patients with low and normal counts of platelets and white cells were compared with dengue viral serology results. Data was analyzed using Window SPSS 10 version.

Results
Mean age of the patients was 32.9± 16.6, ranging from 4 to 80 years. Mean white cell count was 6237 ±4336 ranging from 1400 to 21400/ul. Mean platelet count was 139717 ±100343 ranging from 110000 to 440000/ul. Out of 106 patients dengue viral serology was reactive in 38(35.8%) patients, weakly reactive in 30(28.3%) patients and non-reactive in 38(35.8%) patients.
Out of the 38 patients with a positive dengue viral serology 34(89%) had thrombocytopenia while in 30 patients with weak positive dengue viral serology 22 (73.3%) had thrombocytopenia. Leucopenia was detected in 18 (47.3%) patients out of 38 positive for dengue and 4 (13.3%) patients out of 30 weak positive for dengue viral serology.

Discussion

Dengue Fever is the most common arboviral disease in the world\textsuperscript{5}. As estimated, 2.5-3 billion people in approximately 110 countries worldwide are at risk for dengue infection. Approximately 100 million people are infected annually with dengue with 24,000 deaths worldwide\textsuperscript{6}.

Dengue viral infection must be regarded as a public health problem, and serious efforts must be undertaken for public awareness, surveillance and vector control. Two outbreaks have formally been reported in Pakistan; 1994 and 2005 from Karachi\textsuperscript{5}. Sporadic cases are much more common but under reported. Dengue serology being an expensive and scarcely available investigation is out of reach of a large percentage of Pakistani population especially in the rural areas. Therefore less expensive and easily available hematological parameters might be helpful as suggesting tools for Dengue.

In our study thrombocytopenia was present in 89% and leucopenia was in 47% which is consistent with the findings of other studies, reporting thrombocytopenia in more than 80% of case and leucopenia in less than 50 % of cases\textsuperscript{2}. A local retrospective study done at Aga Khan University Hospital, Karachi on dengue fever, included 210 diagnosed patients. Of these, 56 patients (26.6%) had leucopenia and neutropenia and 77.1% (161) had thrombocytopenia at the time of admission\textsuperscript{7}. Another study at Aga Khan University Hospital, Karachi reported thrombocytopenia present in 78% and leucopenia in 34%\textsuperscript{8}.

Study from Civil Hospital and Dow University of Health Sciences, Karachi reported thrombocytopenia (86%), and Leucopenia (43%)\textsuperscript{9}.

Other studies reported leucopenia from 4.1%\textsuperscript{10}, more than 70%\textsuperscript{11} and up to 90%\textsuperscript{12} in diagnosed cases of Dengue fever. This trend of leucopenia shows marked fluctuation and therefore cannot be a true representative of the disease. On the other hand almost all studies have shown thrombocytopenia in more than 80% of cases, therefore it is fairly indicative for evaluating a febrile illness for dengue viral infection\textsuperscript{13}.

Conclusion

In conclusion thrombocytopenia is a good indicator of dengue fever in clinically suggestive cases. Therefore it is recommended that patients presenting with acute febrile illness with thrombocytopenia, should be screened for dengue viral serology.

References

Antibacterial activity of mupirocin (pseudomonic acid A) against, clinical isolates of methicillin-resistant \textit{Staphylococcus aureus}.

Muhammad Farooq, Shahid Ahmed Abbasi, Tariq Butt, Muhammad Anwar Arain, Aamer Ikram, Adeel Hussain Gardezi, Umar Khurshid

Institution name of writers ??????????????????????????????????????????????

Abstract

Background
Colonized patients and health care workers are the main source of spread of methicillin resistant \textit{Staphylococcus aureus} (MRSA) in hospitals. The elimination of nasal colonized MRSA plays a crucial role in infection control protocols. Mupirocin (pseudomonic acid A) is used for eradication of MRSA nasal carriage. Increasing use of pseudomonic acid A (mupirocin) has lead to emergence of resistance.

Objective
To determine low and high level resistance of MRSA isolates from clinical specimens against mupirocin.

Place and duration of study
Study was conducted at Department of Microbiology, Armed Forces Institute of Pathology, Rawalpindi from July 2006 to June 2007.

Material and methods
Three hundred methicillin-resistant \textit{Staphylococcus aureus} isolates were studied. All clinical specimens were processed for culture and sensitivity. \textit{Staphylococcus aureus} isolates were tested for methicillin resistance using 1µg oxacillin disk. The isolates were further tested by PCR for the presence of \textit{mecA} gene. Minimum Inhibitory concentration (MIC) of mupirocin against MRSA isolates was determined using agar dilution technique.

Results
Out of 300 MRSA isolates, 98% were found to have MIC of mupirocin as \(\leq 4 \mu g/mL\). Remaining 2% isolates revealed low level resistance (MIC \(\geq 8 \mu g/mL\) to 256 µg/mL), no high level resistance (MIC \(\geq 512\mu g/mL\)) against mupirocin was detected.

Conclusions
High level mupirocin resistance has not emerged so far in our setup. Due to increasing use of mupirocin, emergence of resistance against mupirocin among MRSA is a strong possibility. A strategy encompassing rational use of antimicrobials, hospital infection control, surveillance for the detection of mupirocin resistance and judicious use of this agent is required.

Key words
Methicillin resistant \textit{Staphylococcus aureus} (MRSA), Mupirocin, Pseudomonic acid A.

Introduction
\textit{Staphylococcus aureus} is one of the commonest pathogens encountered in nosocomial and community acquired infections in our clinical practice.\cite{12} Methicillin-resistant \textit{Staphylococcus aureus} (MRSA) was reported as a major nosocomial pathogen in 1960s, since then incidence of infections caused by this organism continues to rise.\cite{3,4,5}

Methicillin resistant \textit{Staphylococcus aureus} is a versatile and dangerous pathogen causing infections ranging from relatively mild involvement of skin and soft tissue to life threatening sepsis, pneumonia, endocarditis and toxic shock syndrome (TSS).\cite{12} Almost all the isolates are resistant to penicillin through production of \(\beta\)-lactamases\cite{6} and in recent years more than 50% of hospital acquired \textit{Staphylococcus aureus} are resistant to all \(\beta\)-lactams through production of altered penicillin binding proteins (PBP2a). The infections caused by MRSA increase the length of hospital stay, and are responsible for rising health care costs and mortality.\cite{2,4,7,8,9} Colonized patients are the main source of the spread of MRSA in hospitals. Approximately 10 to 40% of people on admission have nasal carriage of \textit{Staphylococcus aureus}.\cite{10} Colonizing strains may serve as endogenous reservoirs for obvious clinical infections or may spread to other patients.

The elimination of MRSA from the nose plays a crucial role in infection control protocols. Mupirocin, a topical agent is currently used for eradication of MRSA nasal carriage, which is applied to anterior nares 2 – 4 times daily for 5 days.\cite{11} Short-term intranasal mupirocin application may reduce post-operative infection rates.\cite{12} The use of mupirocin also reduces catheter-related infections in dialysed patients using vascular or continuous ambulatory peritoneal dialysis (CAPD).\cite{12}
Mupirocin (pseudomonic acid A) an analogue of isoleucine; is bacteriostatic but appears to be bactericidal at a lower pH; it competitively binds to isoleucyl – tRNA synthetase (IleS) and inhibits protein synthesis. Inhibition of IleS is irreversible and is time dependent, so IleS – mupirocin complex is highly stable.12,13,14

Increasing use of mupirocin has lead to emergence of both low and high level resistance, which may occur during treatment with nasal mupirocin11,13,14. Since the mupirocin usage has been introduced in our setup, and it is imperative that we know the status of resistance of MRSA isolates against mupirocin This study was planned to determine the frequency of resistance among MRSA isolates against mupirocin in our setup so that we could suggest its use in control of MRSA spread.

Materials and methods
The study was conducted at the Department of Microbiology, Armed Forces Institute of Pathology (AFIP), Rawalpindi from July 2006 to June 2007.

This non-interventional study was carried out to find the frequency of mupirocin resistance among MRSA isolates from clinical specimens. The clinical specimens including pus, pus swab, tissue, body fluids, blood, sputum, urine, catheter tips and tubes received for culture and sensitivity were utilized for Gram staining and cultured on blood and MacConkey agar & Mannitol salt agar and incubated for 24-48 hours at 35-37°C. Isolates were identified by colony morphology, microscopy of Gram stain, catalase, coagulase and DNase tests.

Staphylococcus aureus isolates were tested for methicillin resistance by modified Kirby-Bauer disk diffusion technique using 1 µg oxacillin disk (Oxoid, UK) and Mueller-Hinton agar (MAST Diagnostics, UK) containing 4% NaCl. The plates were incubated at 32 – 35 C for 24 hours. Susceptibility to oxacillin was interpreted as per Clinical Laboratory Standard Institute criteria. A zone diameter of ≥ 13 mm was taken as susceptible, 11-12 mm as intermediate and ≤10 mm as resistant15. Strains of Staphylococcus aureus NCTC 6571 sensitive to methicillin and NCTC 12493 resistant to methicillin were used as control organisms15.

The Staphylococcus aureus isolates resistant to oxacillin 1 µg disk were further tested for presence of mecA gene by PCR. Bacterial DNA was extracted from overnight growth of Staphylococcus aureus in brain heart infusion (BHI) using DNA extraction kit (Symbiosis Asti, Italy). It was used as template for PCR16,17 using (5′-CTCAGGTACTGCTATCCACC-3′) and (5′-CAGTTGTATATCCACC-3′) primer pair.9 The amplified product of mecA gene was detected by 1% agarose gel electrophoresis, staining with ethidium bromide and observing under UV light.

Minimum inhibitory concentration of mupirocin (pseudomonic acid A) against MRSA isolates was determined by agar dilution method. Bacterial suspensions matching 0.5 McFarland turbidity standard were inoculated with multipoint inoculator18 (DENLEY) on Mueller-Hinton (MH) agar. The MH agar plates containing mupirocin were prepared using doubling dilution technique with concentrations from 4 µg/mL to 512 µg/mL of the antibiotic. The plates were incubated aerobically at 35-37º C for 18-24 hours and observed for any growth, disregarding any faint haze caused by the inoculum. Isolates growing at 4 µg/mL concentration were taken as sensitive, those between 8µg/mL to 256 µg/mL concentrations were interpreted as low–level resistant and those beyond 256 µg/ml concentration were taken as high–level resistant.13,18

SPSS (version 11) software was used for data analysis. Frequency of the identified mupirocin resistant isolates was calculated in percentage as total number of mupirocin resistant isolates out of total number of MRSA isolates.

Results
A total of 300 MRSA isolates were studied. Majority of isolates (n=235, 78%) were isolated from pus and pus swab and remaining from nasal swab (6%), intravenous catheter tips (4%), blood (4%), body fluids (2%), sputum (3%), ear swab (2%), and stool (1%). One hundred and three MRSA (34%) isolates were recovered from OPD patients, while the remaining (n=197, 66%) were from patients admitted in different wards of Combined Military Hospital, Rawalpindi (Figure 1). Mean age of the patients was 41 years (range new born to 91 years). Median age of the patients was 39 years. Male & Female patient ratio was 3:1.

Two hundred and ninety four (98%) MRSA were susceptible to mupirocin having MIC of ≤ 4 µg/mL. Six (2%) isolates were found resistant to mupirocin having MIC ≥ 8 µg/mL. Four of these isolates were recovered from pus/pus swab, one from blood, and one from nasal swab and all these 6 isolates were

![Figure 1: Ward / OPD distribution of patients from whom methicillin resistant Staphylococcus aureus isolated (n=300)](image-url)
from patient admitted in surgical ward, intensive care unit and bone marrow transplant centre respectively. None of the isolate had MIC of mupirocin of ≥ 16 µg/mL.

Discussion
Mupirocin (pseudomonic acid A) is a topical antibacterial agent. It binds to isoleucyl – tRNA synthetase (IleS), resulting in cessation of bacterial tRNA and protein synthesis. Mupirocin is bacteriostatic but appears to be bactericidal at a lower pH approximating that of many parts of the skin. Identification of an MRSA infection in a health-care setting should initiate careful epidemiologic investigation. Since MRSA are known to be highly transmissible in health-care settings, it is logical to assume that mupirocin resistant isolates would be no less transmissible given the opportunity. Colonized patients and health care workers are the main source of the spread of MRSA in hospitals. Most MRSA appear to originate from endogenous nasal flora and decolonization of nasal carriers may reduce the incidence of surgical site infection and transmission of infection from patient to patient and health care workers, caused by MRSA and the subsequent development of overt clinical infections. Mupirocin has proved extremely effective in eradicating nasal carriage of MRSA from hospital patients and staff and widely used as an infection control measure. Topical mupirocin is still an effective MRSA nasal decolonization agent; however, mupirocin resistance may be associated with decolonization failure.

The prevalence rates of mupirocin resistance vary. In a Brazilian hospital among MRSA it was over 50% where it was used commonly compared to 6% in a nearby hospital where use was infrequent. Prevalence in some other countries varies from 28% (New Zealand), 24% (North America), 18% (Australia), 8.3% (USA) and 3.9% (UK). A low resistance rate in UK is likely due to infrequent use of mupirocin. The high frequency of mupirocin among different countries is alarming.

So far no mupirocin resistance among MRSA has been reported from Pakistan. In our study, 2% MRSA isolates were harbouring low-level resistance to mupirocin but no MRSA isolate was found to have high-level resistance. Mupirocin is used regularly as decolonizing agent for anterior nares in bone marrow transplant centre and strong possibility of mupirocin usage in other wards also. No OPD isolate was found resistant. However, since introduction in our setup, its use is gradually increasing because of high prevalence of MRSA infections and decolonization of anterior nares. There is a strong possibility that low-level mupirocin resistance (LLMR) may increase and high level mupirocin resistance (HLMR) could appear as well in our setup. The results indicated that mupirocin resistant MRSA strains have not disseminated widely in our set-up. The clinical significance of LLMR is dubious. Studies have shown that LLMR strains can be eradicated with prolonged use of Pseudomonic mupirocin, where as HLMR strains cannot be eradicated.

No CLSI guidelines exist for susceptibility testing of mupirocin. Although, BSAC guidelines for disk diffusion susceptibility testing of mupirocin against *Staphylococcus aureus* are available, there is controversy of zone diameter but there is consensus over MIC breakpoints. Minimum inhibitory concentration determination methods are labour intensive and expensive. However, considering the high prevalence of MRSA strains worldwide it seems neither prudent nor feasible to perform MIC on all the isolates. There is need for more studies to evaluate and arrive at a consensus for interpretation of zone diameter. It would be more practical to carry out screening tests by disk diffusion as part of surveillance for early detection of mupirocin resistance.

The emergence of mupirocin resistance and the potential loss of one of the major weapons in MRSA control emphasize the importance of using the agent judiciously. Prolonged or wide spread blanket use of mupirocin in hospital or closed community outbreaks must be avoided. Policies for use of this drug should be agreed locally, reviewed and audited. Some studies support that mupirocin should only be used in documented staphylococcal carriers rather than in all patients for prevention.

Conclusions
High level mupirocin resistance has not emerged so far in our setup. However, considering the high frequency of MRSA infections and increasing use of mupirocin, emergence of resistance among MRSA is a strong possibility. A multi-faceted approach with judicious mupirocin application, strict implementation of hospital infection control measures and surveillance for the detection of mupirocin resistance.

References
-mannitol agar–cloxacillin test: a highly specific bedside screening test
for detection of colonization with methicillin-resistant *Staphylococcus
D, Twombley J, French PP, and Herwaldt LA. Intranasal mupirocin to
prevent postoperative *Staphylococcus aureus* infections. *N Engl J M
aureus* as a major risk factor for wound infections after cardiac surgery.
11. Finlay JE, Miller LA, Poupard JA. Interpretive criteria for testing
susceptibility of staphylococci to mupirocin. *Antimicrob Agents Chemother
of resistance in staphylococci after long term mupirocin application in
13. Cookson BD. The emergence of mupirocin resistance: a challenge to
infection control and antibiotic prescribing practice. *J Antimicrob Chemother
1998; 41: 11–8.
a recent paradigm of emerging antibiotic resistance. *J Antimicrob Chemother
2003; 51: 613-7.
15. Clinical and Laboratory Standards Institute (CLSI).Performance standard
for antimicrobial disk susceptibility tests; Approved standard 9th ed. M2
16. Yamazumi T, Mrshall SA, Wilke WW, Drekema DJ, Pfaffer MA, Jones
RN. Comparison of the Vitek Gram-Positive Susceptibility 106 Card and
the MRSA-Screen Latex Agglutination Test for Determining Oxacillin
M, Qian Q. Methicillin-Resistant *Staphylococcus aureus*: Comparison of
Susceptibility Testing Methods and Analysis of meca-Positive Susceptible
18. BSAC Methods for Antimicrobial Susceptibility Testing. MIC and zone
diameter breakpoints for staphylococci. Working party members. 2006; 5:
20 – 21.
19. Schmitz FJ, Lindenlauf E, Hofmann B, Fluit AC, Verhoef J, Heinz HP,
and Jones ME. The prevalence of low and high level mupirocin resistance
in staphylococci from 19 European hospitals. *Antimicrob Agents Chemother
20. Bradley SF. Methicillin-resistant *Staphylococcus aureus*: long-term care
N. Evaluation of disc diffusion and E-test for determining the susceptibility
of *Staphylococcus aureus* to mupirocin. *J Antimicrob Chemother* 1998;
42: 577- 588.
22. Rotger M, Trampuz A, Piper KE, Steckelberg JM, Patel P. Phenotypic
and Genotypic Mupirocin Resistance among *Staphylococcus* Causing
23. Riley TV, Carlon CF, Bowman RA, Mulgrave L, Golledge CL, Pearman
24. Wertheim HFL, Helene JV , Boelens AM, Belkum AV, Verbrugh HA, Vos
MC. Effect of Mupirocin Treatment on Nasal, Pharyngeal, and Perineal
Carriage of *Staphylococcus aureus* in Healthy Adults. *Antimicrob Agents
**Mycobacterium fortuitum** causing surgical site wound infection.


*National University of Sciences and Technology, Department of Microbiology, Army Medical College, Rawalpindi.
**Military Hospital Rawalpindi.

Abstract

*Mycobacterium fortuitum*, a rapidly growing mycobacterium, is ubiquitous in nature. The organism was considered to be a harmless saprophyte but now there have been several reports from different parts of the world wherein it has been incriminated in a variety of human infections. We report a culture positive case of surgical site infection caused by *Mycobacterium fortuitum*, who responded well to the treatment.

Key words

*Mycobacterium fortuitum*, Rapidly Growing Mycobacteria, Surgical Site Infection.

Introduction

Mycobacteria which grow rapidly are considered uncommon human pathogens. Two members of this group, *M. fortuitum* and *M. chelonae* have been identified as opportunistic pathogens. *M. fortuitum* is ubiquitously distributed in nature, it has been recovered from soil, dust, water and milk. It is also present in the saliva and sputum of asymptomatic people. These organisms are of relatively low virulence and infections are generally associated with decreased host resistance or a heavy inoculum. It has been reported as the causative agent in a variety of human infections in different parts of the world. We report a case of culture positive surgical site wound infection caused by *M. fortuitum*.

Case report

A 45-years-old post renal transplant patient, presented to the out patient department of Dermatology at Military Hospital, Rawalpindi, with the complaints of multiple non-tender nodules on surgical wound site on the anterior abdominal wall for 4 months. Initial lesion appeared as a small nodule which gradually increased in size and developed suppurration and purulent discharge. The lesions gradually increased in number. Examination of anterior abdominal wall showed three oval nodular lesions along the line of incision, each measuring 2-3 cm. They were non-tender, firm to cystic on palpation. Two more nodules not visible externally but were felt on palpation. Routine haematology, urinalysis and biochemical tests were all within normal limits.

Pus swabs were taken with aseptic precautions from the lesions. Ziehl-Neelsen method showed acid fast bacilli. Swabs were inoculated on Blood (Oxoid), MacConkey’s agar (Oxoid) and Lowenstein-Jensens (LJ) medium (Oxoid) and incubated at 37°C. After 3 days of incubation, a number of small creamy white colonies appeared on Blood agar, lactose fermenting colonies on MacConkey’s agar, and rough and buff colonies on LJ medium. The isolate was identified as *M. fortuitum* by standard microbiological techniques. It was catalase positive, urease positive and reduced nitrate. Antimicrobial sensitivity was done on Mueller Hinton agar (Oxoid) using Kirby Bauer disc diffusion technique which showed the isolate to be sensitive to ciprofloxacin, azithromycin and co-trimoxazole. The isolate was resistant to polymyxin B, further adding to confirmation.

We were unable to perform polymerase chain reaction based identification due to non-availability of primers. The patient was started on oral co-trimoxazole and azithromycin and he improved gradually.

Discussion

*M. fortuitum* is a rapid growing mycobacteria which form part of Runyon group IV. It is a non-tuberculous mycobacterium and an emerging pathogen. Clinical presentation includes mainly cutaneous and soft tissue infections; keratitis, pulmonary infection, lymphadenitis, arthritis, osteomyelitis, and rarely meningitis, peritonitis, endocarditis, and hepatitis, mainly in patients with impaired cellular immunity or receiving glucocorticoid therapy.

Our patient had a cutaneous infection following a renal transplant with immunocompromised state. Cutaneous lesions caused by *M. fortuitum* may present in three clinical settings: post surgical e.g. after liposuction, silicon injection, pedicures and subcutaneous injections; as part of disseminated disease, usually in an immunocompromised host; and primary cutaneous infections (non-surgical). The last type usually occurs as a localized infection in an otherwise healthy individual, with a history of trauma 1-2 months prior to developing symptoms at the site. The patients may present with abscesses, ulcers, draining sinuses, cellulitis or tender erythematous nodules. Occasionally the lesions may be multiple and tend to be distributed along the course of the afferent lymphatic, simulating the lesions of sporotrichosis, often referred to as ‘sporotrichoid mycobacteriosis’.

Our patient acquired the infection after four months of surgery while he was on immunosuppressive drugs. This gives an

**Corresponding Author:** Fatima Kaleem,
National University of Sciences and Technology,
Department of Microbiology, Army Medical College,
Rawalpindi.
Email: fatima_kaleem@hotmail.com.
indication towards the acquisition of infection from the environment where it is ubiquitously distributed. Majid et al also reported a case of environmentally acquired *M. fortuitum* infection. Similarly Ip and Chow reported three cases of *M. fortuitum* infection following local steroid injections from a single practitioner.

Medical treatment of deep-seated infection is difficult due to poor drug penetration and survival within macrophages. Rapid growing mycobacteria as a group are resistant to the conventional anti-mycobacterial agents used to treat tuberculosis but are susceptible to several other antibiotics. Hence proper identification of the isolates and their sensitivity pattern are important for selection of appropriate antibiotics. Resistance often develops with monotherapy, necessitating a multi-drug combination. Recommended duration of therapy varies from 3–4 months depending upon clinical resolution. Approximately 10 to 20% of infections resolve within a few months, in other cases, wound debridement and removal of the infected prostheses may be required. Our case is an example of successful medical treatment of such an infection. Combination of co-trimoxazole and azithromycin proved efficacious to eradicate the infection.

Death from *M. fortuitum* skin infections is infrequent and if it occurs, it is usually due to the underlying disease with the *M. fortuitum* infection playing a secondary role. The morbidity and mortality due to this rare infection can be prevented by rapid diagnosis and the early treatment based upon the sensitivity report.

**Conclusion**

Pus samples from immunocompromised patients should be dealt with a high index of suspicion and inclusion of appropriate media are likely to prove beneficial.

**References**

Audits in Infection Prevention and Control

Dr. Shehla Baqi
Associate Professor in Infectious Diseases
Sindh Institute of Urology and Transplantation, Karachi, Pakistan.

IDJ is publishing a series of Audits that can help the Infection Control Practitioner (ICP) to objectively document problems that he/she has observed at the health care facility using audit tools.

Audit means checking actual practice against a standard. The audit tool should be standardized so that it can be applied throughout the healthcare facility and must match the practice and resources of the facility. Therefore the audit tools published by IDJ can be modified by the user, as long as the principles of Infection Control are not compromised.

These audit tools assume that the ICP is aware of the principles of Infection Control and well conversant with correct practices. Ward staff can assist with the audit process. The purpose of the process is to identify risks of infection and unsafe practices for both patients and staff. This audit tool applies to the operation theater.

The answer on the left side of the Yes and No column, where applicable, is the correct answer and should be the one that will be circled if your hospital is following the correct Infection Control practices.

Audit of OT

Location: _____________
Auditor: _____________
Date: __ / __ / ____   Time: ________

1. Environmental Cleaning

Floors clean: Yes No
Floors easy to clean (smooth, antistatic material, impervious): Yes No
Blood stains: No Yes

If yes, where: __________
Dry mopping: Yes No
Mop disinfected by bleach prior to use: Yes No

Cleaning agent: Phenyl Bleach Detergent Other: __________

Disinfectant solution correctly prepared: Yes No
Damp dusting: Yes No
Construction in patient area: No Yes

If Yes, cordoned off: Yes No

Cleaning Protocol at OT

2. Waste Disposal

Waste segregated into Infectious/Non-Infectious: Yes No
Body parts wrapped in plastic bags: Yes No

What is final disposal of Infectious Waste:

Sharps in waste basket: No Yes
Sharps container: Yes No

If yes, overfilled: No Yes

3. Cleaning of Surgical Equipment

Soiled instruments transported in closed/wrapped tray: Yes No

Instruments such as scissors, pickups, left soaking in an antiseptic solution: No Yes

Audit of the Health Care Worker Doing Cleaning of Equipment:

Gloves worn: Yes No
If yes, heavy duty rubber gloves: Yes No

Gown worn: Yes No

Where is cleaning done:
Manual cleaning   Machine

Cleaning with: Cold water   Hot water

Instruments kept below surface of the water to prevent splashing: Yes No

Corresponding Author: Shehla Baqi,
Associate Professor in Infectious Diseases
Sindh Institute of Urology and Transplantation,
Karachi, Pakistan.
E-mail: shehlabaqi@gmail.com
### 4. Surgical Scrub

**Surgical Hand Wash Facility:**

- Ratio of Facilities to OT Theaters: [ ] / [ ]
- Easy Access from Scrub Facility to OT: Yes No
- Tap operated by: hand Yes No elbow pedal
- Facility clean: Yes No
- Dispensers filled: Yes No
- Dispensers functional: Yes No
- Water: Cold Yes No Warm

**Comments:**

---

**Agent used:**

- Liquid Soap Yes No
- Alcohol Rub ______% Yes No
- Iodophors Yes No

**Audit of OT Personnel:**

- Surgeon Technician

**Hands above level of elbow during scrub:**

- Yes No
- Areas Covered:
  - Hands
  - Subungual areas
- Forearm
- Brush for nails: Available Yes No Not Available
- If nail brush available: Single Use Yes No Multiple Use

**Hand Scrub Brush:**

- Available
- If yes: soft brush Yes No hard brush No Yes sponge
- Time duration of 3-5 minutes:
- Yes No
- Towel to Dry:
- Yes No
- If yes, sterile Yes No single use No Yes multiple use
- If no, what is used to dry hands?

**Hands held up above waist before wearing gloves and gowns:**

- Yes No

**If Alcohol Rub being used:**

- Hand wash at beginning of cases
- (in the morning):
- Yes No
- Duration of alcohol rub ______ minutes

### 5. Personal Protective Equipment

**a. Gowns**

- Gowns are sterile:
- Yes No

- Gowns are impervious and water repellent:
- Yes No
- Gowns used for more than one surgery:
- No Yes

**How stored:**

- individually packaged Yes No placed open on trolley No Yes
- When are gowns donned:
  - after scrub Yes No
  - before scrub
  - Where are the gowns donned:
  - Close to the Hand Scrub facility Yes No
  - Before going into OT

**How are the gowns removed:**

- Observation of HCW
  - Washed hands Yes No
  - Held gown at neck on inside and permit to unfold Yes No
  - Slide hands and arms down the sleeves Yes No
  - Fasten the ties at the neck Yes No
  - Fasten ties at waist Yes No

**How are the Gowns Removed:**

- Observation of HCW
  - Remove gloves first Yes No
  - Slide gown down arms and over hands by holding inside of sleeves Yes No
  - Hold gown with both hands at shoulder seams Yes No
  - Turn gown inside out, gown rolled and discarded Yes No
  - Wash hands after removing gloves Yes No
  - Gown where discarded:

**If not donned or removed appropriately, how are the gowns being worn and removed:**

---

**b. Gloves**

**Putting on Gloves**

- Surgical Scrub first Yes No
- Is there assistance to open gloves since outside not sterile Yes No
- Inner wrapper opened such that gloves palms up Yes No
- Pick up first glove with the cuff touching only inside portion of the cuff Yes No
- Wear gloves holding them above waist level Yes No
- Pick up second glove by sliding fingers of gloved hand under cuff Yes No
- Was gloved hand contaminated by the ungloved hand Yes No

**Removing Gloves**

- Pull glove so it turns inside out and leave it partially on Yes No
- Second glove removed part way off Yes No
- Pull off 2 gloves at same time Yes No
- Only inside surface of the gloves touched Yes No

**Where gloves discarded:**

---
Hand hygiene after removing gloves | Yes | No
Walking around wearing gloves | No | Yes
Gloves single patient use | Yes | No

**c. Masks**

| Hanging around neck | No | Yes
| In pockets | No | Yes

**Sterile Field**

Sterile field is created by placing sterile towels/surgical drapes around the surgical site. Additional sterile fields may be established such as on the stand that holds instruments. When gloved the sterile area extends from chest to the level of the sterile field. Sleeves are sterile from 5 cm above the elbow to the cuff. Neck line, shoulders and back are unsterile.

| Sterile drape around surgical site | Yes | No
| Sterile items placed on sterile trolley | Yes | No
| Opening, dispensing, transferring sterile items without contaminating | Yes | No
| Use of items that are below sterile field | No | Yes
| Sterile personnel reaching across unsterile areas | No | Yes
| Sterile personnel touching unsterile items | No | Yes
| Sterile items placed near windows and doors | No | Yes
| Personnel not moving out of the sterile field | Yes | No
| Moisture in sterile field is avoided e.g drapes are dry | Yes | No

**d. Surgical Prophylaxis**

Pre-operative showering to lower skin flora concentration | Yes | No
Antibiotics given within 60 minutes of incision | Yes | No
Hair removal method: electric clippers shaving (not recommended) | Yes | No
Washing and cleaning at incision site before antiseptic use | Yes | No
Antiseptic agent used for skin preparation: Alcohol Chlorhexidine Pyodine
Antiseptic is applied in concentric circles moving towards the periphery | Yes | No
Antiseptic is allowed to dry first | Yes | No

**6. OT Design**

| OT separated from main flow of hospital traffic and main corridors | Yes | No

**Suggested Layout for OT Complex Zones**

1. **Outer Zone:**

| Is there an outer zone | Yes | No

2. **Clean or Semi-Restricted Zone**

| Is there a clean/semi-restricted zone | Yes | No

3. **Aseptic or Restricted Zone**

| Is there a sterile preparation room for surgical instruments and equipment | Yes | No
| Does staff change into theater clothes, masks and gowns before entering the OT | Yes | No
| Are clean/sterile supplies taken to or from supply area on a covered cart | Yes | No
| Is dust cover removed, when cart enters the surgical suite | Yes | No
| Are supplies entering the suite removed from their transport containers before entering the OT | Yes | No
| Soiled items separated from sterile items | Yes | No

**OT Temperature:** (18-24 degrees)

| Is it cooler than outer area | Yes | No

**OT Humidity:** (should not be less than 55%)

| Air Ventilation System: Positive Pressure | Yes | No
| Air changes: (at least 20 per hour) | Yes | No
| Filtration with pre-filters (30% efficiency) | Yes | No
| Final filtration (95%) | Yes | No

| Air enters from ceiling and exhaust at floor | Yes | No
| Ultraviolet Germicidal Irradiation | Yes | No
| Door closed | Yes | No
| Windows closed | Yes | No
<table>
<thead>
<tr>
<th>Traffic limited</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laminar flow</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>HEPA Filters</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

| How many operations in the room at the same time | |

### Types of Air Supply:
- Plenum ventilation
- Laminar Flow
- ACs
- Suction apparatus and ventilators with bacterial filters: Yes | No
- MDR patients at end of OT list: Yes | No
- Soiled linen bagged: Yes | No

<table>
<thead>
<tr>
<th>Sorting of Linen into soiled and non-soiled done at source</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If not, where does linen go:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who does sorting:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Any other Comment:                                          |     |

---

**PakMediNet**

1st Database of Pakistani Medical Journals on Internet

http://www.pakmedinet.com

**Featuring:**
- Abstracts of Medical Journals of Pakistan including their new and old issues,
- Research Guidelines for young doctors,
- Problem causes,
- Discussion Forum and views of doctors on research titles
- Help for young doctors to find research references for their dissertation and thesis
- And many more...

**You can access Infectious Diseases Journal of Pakistan at:**

http://www.pakmedinet.com/journal.php?id=idj
The epic flood of 2010 has taken hundreds of lives and devastated tens of thousands of homes. Millions of people have been displaced and the landscape remains ravaged. An onslaught of infectious diseases is expected to further add to morbidity and mortality.

Massive dislocation of a population may lead to an increase in disease transmission. Populations may move into areas where pathogens exist, to which the immigrants have no specific immunity. Evacuation to camps following mass migration or loss of housing is particularly dangerous from an infectious disease perspective. Refugee camps tend to combine high population density and poor sanitary conditions, a perfect prescription for fecal-oral, airborne droplet and skin infections by contact of disease pathogens. Environmental changes result in fresh invasion by animals and vectors.

Well meaning groups or individuals are trying to help prevent and treat diseases but the efforts are in isolation and uncoordinated. Under uncontrolled conditions, medicines-antimicrobials especially tend to be given away without understanding the basics or principles of their rational use.

The Infectious Diseases Society of Pakistan (IDSP) has collectively written recommendations in consultation with WHO guidelines and Cochrane library, while keeping in view endemicity of diseases in our local population, cost effectiveness of preventive and treatment modalities, and practicality of drug dispensation.

Diagnoses in calamity situations are at best presumptive. Under circumstances where laboratory confirmation is nonexistent; judgments must be made on clinical grounds while over treatment should be considered as erroneous as under treatment or negligence. At the same time wastage of precious resources should be minimized. A balance between need and delivery is essential for optimum success in health care.

Communicable Diseases Associated with Floods

Modes of disease transmission

- **Water borne diseases**

**Viruses**

*Rotavirus, Norwalk virus, Polio, Hepatitis A, Hepatitis E*

**Bacteria**

*Vibrio cholera*, *Escherichia coli* 0157, *Salmonella typhi*, *Shigella flexneri*, *Campylobacter pylori*, *Chlamydia trachomatis*  
Most diarrheas are due to viruses or toxins and do not require antibiotics. Rehydration is critical

*Only these infections require antibiotic.*

**Protozoa**

*Giardia lamblia, Entameba histolytica, Cryptosporidium parvum, Cyclospora cayetanensis Balantidium coli, Naegleria*

**Helminths**

*Strongyloides stercoralis, Dracunculus medinensis, Echinococcus*

- **Airborne infections**

**Viruses**

Viral influenza, respiratory syncitial virus, adenovirus, common cold viruses, measles, mumps, rubella, pertussis, varicella

**Bacterial**

*S. pneumonia, Mycoplasma, Legionella, N meningitides, Mycobacteria tuberculosis*

**most airborne infections are due to viruses and do not require antibiotics**

- **Vector borne diseases**

*Malaria, dengue, Japanese encephalitis, viral hemorrhagic fever, leishmaniasis, plague, trachoma*

- **Skin and soft tissue infections**

*Impetigo, cellulitis, boils, furuncles (staphylococcal) Scabies, lice (Gp A strep and Staph Aureus)*

- **Animal bites**

Snakes, Dogs (Rabies)

- **Risk factors for increased HIV transmission in emergencies**

Anger and frustration leading to sexual violence, injecting drug use; unsafe blood transfusions, non availability of ARVs, reuse of needles
1. Hygiene and Clean Water
   a) Soap for hand washing and bathing should be provided as a priority item, and personal hygiene stressed and practiced as much as possible.
   b) Purification of drinking water: Chlorination with PUR sachet is a cheap, effective and easily accessible way of purifying water, 1 sachet costing Rs 5/ will disinfect 10 liters of water.*
   *Provide individual 10 L capacity bucket, a mug and 1 meter white mulmul cloth. Also, toilet and laundry soap

2. General Diarrhea and Vomiting Treatment
   Educate regarding rehydration and continuing breast-feeding for infants who are breast-fed
   a) ORS: dissolve 1 sachet in 1 liter of clean water
   b) IV Fluids (0.9 NS and Ringer lactate drips) for severe dehydration. In children if shock: 0.9%NS 10 ml/kg bolus then Ringer lactate 90 ml/kg over 4 hours. If no shock Ringers lactate 100 ml/kg over 4 hours
   c) Syp zinc (strength 20mg/5ml) 1 tsf/day for 14 days (in children)
   d) Anti diarrheal (such as lomotil): not recommended because of risk of toxic mega-colon
   e) Ciprofloxacins for bloody diarrhea or severe acute watery diarrhea with dehydration, or child less than 6 months old with toxicity
   Dose: Adults: 250 mg twice a day for 3 day
   Peds: 10mg/kg/dose every 12 hours for 3 day
   Flagyl 400 mg tds if amebic dysentery suspected in adults, *(Flagyl should not be used as a general anti diarrheal)*

3. Acute Respiratory Infections
   Most acute respiratory infections are viral and self limiting and do not need antibiotic therapy. Supportive care may be given.

   Pneumonia in Adults
   Levofoxacin 750mg daily for 7-10 days

   Pneumonia in Children
   Amoxicillin  2-12 months: 125mg three times a day for 7 days
   12 months to 5 years: 250 mg three times a day for 7 days
   5-14 years: 20 mg/kg/day divided 3 times a day for 7 days

4. Eye Infections
   § Mostly secondary to viral infection, hence no specific treatment required.
   § If symptoms persist more than 3 days or purulent discharge then use topical chloramphenicol eye drops.
   § If symptoms persist for more than 2 wks, give oral erythromycin 12.5 mg/kg qid x 14 days for trachoma.

5. Vector Control
   Insect repellants may be used. Permethrin impregnated bed nets, if practical

6. Skin and Soft Tissue Infections
   Scabies
   Local application of Benzyl benzoate or permethrin lotion. (Apply all over body from neck down, keep on for 24 hours, bathe and repeat once more)
   Impetigo, cellulitis, boils, furuncles
   Cephadrine (adults) 250 mg orally every 6 hours or 500 mg orally every 12 hours, children 25 to 50 mg/kg/day in divided doses every 6 to 12 hours, or Cloxacillin Dose: 500mg every 6 hours (adults), or Amoxicillin /Clav 375 mg tds x 5-7 d
   Local antiseptics: Pyodine, Gentian violet

7. Serious Systemic Infections
   Typhoid
   Cefixime:
   Adults: 400mg twice a day for 14 days
   Peds: 16mg/kg once a day for 14 d

   Typhoid (if not responding to cefixime) or leptospirosis, give:
   Ceftriaxone: Adults: 2g daily

   Meningitis
   Ceftriaxone 2g twice a day

8. Antimalariais
   For suspected P falciparum or P vivax: Co artemether (40/240)
   Dose: 2 stat, 2 after 8h, then od x 2 d (8 tab)
   Children: 20/120 (5-15 kg) 1 tab stat, then 1 tab after 8, 24, 48h
   15-25 kg 2 stat, 2 after 8, 24, 48 h

   For proven vivax species: Chloroquine 250 mg tab 4 stat, 2 after 6 hours, 1 bd for 2 d (10 tab)

9. Antifungal
   Topical antifungal clotrimazole in combination with 1% hydrocortisone.
   Tinea capitis: Terbenafine 250 mg 1 od for > 10 yrs, or ½ for< 10 yrs, for 14 days
10. **Deworming**
Syp Zentel or vermox, single dose.

11. **Tuberculosis**
Patients already on anti TB treatment should be helped to continue their medications with first line drugs in fixed drug combination. New suspected cases of TB should be referred to tertiary care hospitals.

12. **Snake Bite**

**First Aid**
R= Reassurance. 70% of all snake bites are from non venomous species. Only 50% of venomous species actually envenomate.
I=Immobilise in same way as a fractured limb with bandage or cloth. Do not apply compression.
G.H=Get to Hospital immediately.
T=Tell the doctor of any systemic symptoms

**Anti Snake Venom (ASV)**
- Anti snake venom in Pakistan is polyvalent i.e effective against all 4 common species; Russells viper (Daboia russelii), Common Cobra (Naja naja), Common Krait (bungarus caeruleus), Saw Scaled viper (Echissochureki/multisquamatus).
- Available in two forms:
  a) Liquid (NIH) more effective as produced from Pakistani snake venom, but requires reliable cold chain and refrigeration and has a 2 year shelf life.
  b) Lyophilized (Indian) in powder form requires only to be kept cool.
- **Indications**
  Anti-snake venom carries risks of anaphylactic reactions and should be used only if evidence of coagulopathy: Primarily detected by 20WBCT (20 min whole blood clotting test) or visible spontaneous systemic bleeding, hemoptysis etc.

**Evidence of neurotoxicity**
- Ptosis, external ophthalmoplegia, muscle paralysis, inability to lift the head etc.

**Dosage**
- Neurotoxic/Anti Hemostatic 8-10 Vials NIH/Indian
- Confirmed Saw Scaled Viper 4 Vials NIH
- Ø As a general rule if type of snake not known 8-10 vials of Indian or 4 vials of NIH can be used for initial dose.
- Ø Repeat doses q 6hrs if coagulopathy is not restored on clotting test up to a maximum of 30 vials for haemostatic envenomation. For neurotoxic venom dose can be repeated at 1-2 hrs if no improvement or worsening up to a maximum of 20 vials.

**Administration**
1. Intravenous Injection
   Reconstituted or liquid ASV is administered by slow IV injection (2ml/min). Each vial is 10ml of reconstituted ASV.
2. Infusion:
   Liquid or reconstituted ASV is diluted in 5 -10ml/kg body weight of isotonic saline or glucose.

All ASV to be administered over 1 hr at constant speed. Children and pregnant women are treated with same dosage. For victims who arrive late (often up to several days) perform a 20WBCT and determine. If any coagulopathy administer ASV. If neurotoxic symptoms, administer 1 dose of 8-10 vials of ASV.

**ASV reaction**
At first sign of urticaria, itching, fever, shaking chills nausea, vomiting, diarrhea, abdominal cramps, tachycardia, hypotension, bronchospasm and angio edema.

  a) Discontinue ASV
  b) Give 0.5mg of 1:1000 adrenaline IM (children 0.01mg/kg body weight)

Once stabilized, the ASV can be restarted slowly over 10 -15 min, under close observation. Then normal drip rate should be resumed.

13. **Dog Bite**
Wash and flush wound immediately with soap and clean water for 15 mts., then clean with antiseptic. Inject 1 dose of any cell culture vaccine IM into deltoid. Further management of deep wounds with Rabies immunoglobulin should be done at a hospital.

14. **Vaccines**
For pediatric age group: EPI vaccines should be continued, especially for measles.

For adults no injectable vaccination is recommended in the current phase of this emergency for the following reasons:
  a) Most vaccines require 2 or more injections to be effective. It would be logistically difficult to attain this goal
  b) It is not possible to maintain cold chain in flood affected areas
  c) Re-use of needles and syringes is likely to occur in majority of cases, further compounding the already high incidences of Hepatitis B and C and HIV

15. **Personal Protection**
Gloves, masks and hand sanitizers should be provided in large quantities and used.
16. Laboratory
Rapid malaria detection tests are easy and cost effective for diagnosis of malaria and its species. A positive test will help rule out dengue and typhoid fever and help in correct management of malaria. It will also help in malaria surveillance.

List of Essential Medicines against Infectious Diseases
- Soap
- Water purifiers
- Paracetamol, other analgesic/antipyretics
- ORS sachets
- IV solutions- Ringer’s, 5% D/W, Normal saline
- Zinc syrup
- Ciprofloxacin tab, syp for children
- Flagyl (limited quantities)
- Levofoxacin
- Amoxicillin
- Chloramphenicol eye ointment
- Erythromycin tab
- Insect repellants
- Permethrin lotion
- Pyodine, gentian violet
- Amoxy/clav
- Lincocin, clindamycin
- Cefixime
- Inj Ceftriaxone
- Co artemether
- Chloroquine
- Cotrimazole with 1% hydrocortisone
- Albendazole (Zentel), Mebendazole (Vermox)
- Myrin P Forte (Only for those already on treatment so that they don’t default)
- Anti snake venom
- Anti rabies vaccine (Verorab, Rabipur, Lyssavac, Abhayrab)
- Gloves, masks, hand disinfectants

The following Infectious Diseases consultants and clinical microbiologists offer to answer queries:

**Adult ID**
- Dr Naseem Salahuddin 021 3511-2709/2117
- Dr Faisal Mahmood 021 3486-4574
- Dr Farheen Ali 021 3486-4574
- Dr Shehla Baqi SIUT, Karachi
- Dr Faisal Sultun Shaukat Khanum, Lahore

**Pediatric ID**
- Dr. Anita Zaidi 021 3486 4955
- Dr Asad Ali 021 3486 4955
- Dr. Ejaz Ahmed Khan 051 460-3256/3076

**Clinical Microbiology**
- Dr Altaf Ahmad 021 3511-2709/2372
- Dr Fatima Noman 021 493-9612
Matter required for News & Views page
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. The Editors review Correspondence. Authors may also submit the names and contact informations 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). The complete document appears at . Please submit one complete copy of the manuscript and all enclosures to The Editor, Infectious Diseases Journal of Pakistan, Department of Microbiology, Armed Forces Institute of Pathology, Rawalpindi, Pakistan. An 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

I. Original Articles
Articles should report original work in the fields of microbiology and infection.

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

Abstract
Abstract should not exceed 200 words and must be structured in to separate sections headed Background, Results and Conclusions. Please do not use abbreviations or cite references in the abstract. A short list of four to five key words should be provided to facilitate.

Background
The section must clearly state the background to the research and its aims. The section should end with a very brief statement of what is being reported in the article.

Materials and Methods
Please provide details of subject selection (patients or experimental animals). Details must be sufficient to allow other workers to reproduce the results. The design of study and details of interventions used must be clearly described. 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 the new and important aspects of the study and conclusions that follow from them. 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.

Please see below for format of References, Figures and Tables.

II. 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 an Abstract; Main Text divided into sections, Conclusions and References.

III. 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.

IV. 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, 2 illustrations or tables and up to 10 references. The authorship should not exceed 3-4 persons.
V. Letter to the Editor
These may relate to material published in the IDJP, topic of interest pertaining to infectious diseases, and/or unusual clinical observations. A letter should not be more than 300 words, one figure and 3-5 references.

VI. News and Views
Informative, breaking news updates in infectious diseases from around the world (approx. 200 words).

VII. 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 consecutively in the order in which they are first mentioned in the text. Identify 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. Bibliography should be given in order.


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. Each table must be presented on a separate sheet of paper and numbered in order of appearance in 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, given suitable legends and marked lightly on the back with the author’s name and the top edge indicated. Original drawings may be submitted although high quality glossy photographs are preferable. They should be kept separate from the text. 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 line illustration (e.g. graphs): 600 dpi
- Black & white halftone illustrations (e.g. photographs): 300 dpi
- Colour illustrations: 400dpi (note that colour images should be split CMYK not RGB)

Important Notice
Financial support: All authors must disclose any financial support they have received during the course of the study or investigation.

Conflict of Interest: If there is a conflict of interest then this must be disclosed by the author or authors at the end of the article to be submitted.

Ethical Guidelines
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. The Editors may require this statement.

All scientific research that uses animals in their study protocols must include a statement on the ethical treatment of animals during the study.
### Membership Application Form

**Infectious Diseases Society of Pakistan**

<table>
<thead>
<tr>
<th>Name</th>
<th>Mailing Address</th>
<th>Institute/Organization</th>
<th>Department &amp; Division</th>
<th>Field of Interest</th>
<th>Designation</th>
<th>PMDC No.</th>
<th>Phone No. Residence</th>
<th>Office</th>
<th>Cell</th>
<th>E-mail</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Degree/Diploma:</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MBBS</td>
<td>MD</td>
<td>MSc Biological Sciences</td>
<td>BSc Nursing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRCP</td>
<td>MCPS</td>
<td>FRCS</td>
<td>FCPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRCPH</td>
<td>Ph. D</td>
<td>M. Phil</td>
<td>Pharma. D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCH</td>
<td>Diplomate American Board of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Application for membership 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**

**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
  1. Life: with payment of Rs.3000/-
  2. Annual: with 1 year fee of Rs.500/-

**Associate Membership:**

Ph. D, Master degree & M. Phil in biological sciences, BSc in Nursing & allied medical science with 1 yearly fee of Rs.500/-

**Privileges of Membership:**

**Full Member:**

- 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 Member:**

- 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/ crossed cheque/pay order or bank draft made out to Infectious Diseases Society of Pakistan.

**Mailing Address and Contact Nos:**

Infectious Diseases Society of Pakistan
E-mail: idsp123@yahoo.com