March 2008

Primary drug resistance against Mycobacterium tuberculosis in Karachi

Nisar Ahmed Rao
Aga Khan University

Muhammad Irfan
Aga Khan University

Shahid Javed Hussain
Aga Khan University

Follow this and additional works at: http://ecommons.aku.edu/pakistan_fhs_mc_med_pulm_critcare

Part of the Respiratory System Commons, and the Respiratory Tract Diseases Commons

Recommended Citation

Available at: http://ecommons.aku.edu/pakistan_fhs_mc_med_pulm_critcare/12
Summary box

- Radiation safety is important.
- Radiation exposure can lead to stochastic and non-stochastic injuries.
- Knowledge regarding radiation safety is lacking.
- Radiation safety practices are not according to recommendations.
- Radiation protection devices are not routinely available everywhere.

References


Original Article

Primary drug resistance against Mycobacterium Tuberculosis in Karachi

Nisar Ahmed Rao, Muhammad Irfan, Shahid Javed Hussain

Department of Medicine, Aga Khan University, Karachi, Pakistan.

Abstract

Objective: To evaluate the primary drug resistance of new culture positive cases of pulmonary tuberculosis in Karachi.

Methods: All new suspected pulmonary tuberculosis patients were recruited initially. They were instructed to produce three sputum samples for smear examination and on one of the specimen’s culture was applied. Bronchoscopy and bronchial wash was done in patients who were not expectorating. Bronchial wash was then applied for both smear and culture for mycobacterium tuberculosis.

Results: Out of 79 cases recruited initially, 52 were able to produce sputum while bronchoscopy was performed in the remaining, AFB direct smear was positive in 32/52 sputum and 12/27 bronchial wash samples. Later, 02 sputums and 04 bronchial washes became culture positive which were initially smear negative. All cultures were of Mycobacterium tuberculosis species. These fifty culture positive cases were then included in the final analysis. Pyrazinamide was the most sensitive drug i.e. 49 isolates (98%). The resistance pattern is as follows: Streptomycin 13(26%), Isoniazid 08 (16%), Ethambutol 08 (16%), Rifampicin 04 (08%) and Pyrazinamide one (02%). Multi-Drug Resistant tuberculosis was observed in 02 (04%) patients.

Conclusion: In this small study, the high prevalence of primary resistance against streptomycin, INH and Ethambutol raises an urgent need of a proper nationwide survey to evaluate the true picture of primary resistance (JPMA 58:122; 2008)

Introduction

In Pakistan, tuberculosis constitutes a major public health problem and its incidence is rising due to multi-factorial reasons including poverty, ignorance, over the counter sale of anti-tuberculosis drugs and availability of poor quality medications. Globally Pakistan has been ranked 7th in terms of estimated number of cases by WHO,
with an incidence of 181/100,000 persons.\(^1\)

The data on resistant tuberculosis is sparse from Pakistan and for the successful control of tuberculosis there is a need to have regular surveillance of resistance pattern in the community. The aim of the study was to evaluate the present scenario of primary drug resistance of new cases of pulmonary tuberculosis in Karachi. This study will have an impact on management guidelines.

**Patients and Methods**

This study was conducted from October 2004 to August 2005 at pulmonary section, Department of Medicine, Aga Khan University Hospital, Karachi. Karachi is the largest metropolis of Pakistan with a population of more than 11 million. Aga Khan Hospital (AKH) is a 600-bedded tertiary care teaching hospital located in Karachi, Pakistan. The hospital and laboratory are accredited with Joint Commission of International Accreditation (JCIA). Laboratory is routinely participating in external quality control surveys with College of American pathologists (CAP) since 1992. The number of patients seen in Pulmonology outpatient clinics exceeds 14,000 per year.

Cases were enrolled from the pulmonary clinics of Aga Khan University Hospital (AKUH). Majority of the recruited patients were from middle and low socio-economic group. All patients have full access to over the counter sale of anti-TB drugs.

Patients with suspected pulmonary tuberculosis on clinical and radiological grounds were recruited initially. In this study none of the recruited patients purchased the ATT (Anti-tuberculosis treatment) over the counter, which was specifically inquired, and patients with past history of ATT were excluded. Assurance was made that they were new cases and had never received anti-tuberculosis treatment in the past.

The recruited subjects were instructed to produce three-sputums sample for AFB (Acid fast bacilli) smear examination and on one of the specimen culture was applied. Bronchoscopy and bronchial wash was done in patients who were not expectorating. Bronchial wash was then applied for both smear and culture of mycobacterium tuberculosis.

All samples were decontaminated with N-acetyl-L-cysteine (NALC) sodium hydroxide according to standard protocol. The sediments were used for AFB microscopy and culture.

Smears for microscopy were screened using Auramine Rhodamine staining, positive slides were further confirmed by staining with Kinyoun modification of Ziehl-Neelson stain.

For TB cultures, LJ and MGIT (Becton Dickinson) were used. For LJ slant 0.1 ml of concentrated specimen was inoculated and incubated for 8 weeks. Suspected colonies were identified on the basis of conventional tests. Specimens in BACTEC and MGIT were inoculated as per manufacturer's recommendations.

Antimicrobial susceptibility for anti tuberculosis drugs except Pyrazinamide tested using modified agar proportion method according to Clinical Laboratory Standards Institute (CLSI). Pyrazinamide was tested using BACTEC 12B according to manufacturer's recommendations.

MTB H37Rv was used as control with each batch of susceptibility testing.

In the final analysis, only culture positive cases for M. tuberculosis were included.

**Results**

A total of 79 cases were recruited initially. Fifty-two were able to produce sputum while bronchoscopy was performed in the remaining. AFB direct smear was positive in 32/52 sputums and 12/27 bronchial wash samples. AFB direct smear was positive in 32 sputum samples while 12/27 bronchial wash samples were also positive. Later, 02 sputum and 04 bronchial washes specimens turned out culture positive, which were initially smear negative. All cultures were of Mycobacterium tuberculosis species. These fifty culture positive cases were then included in the final analysis.

There were 33 male and 17 female with median age of 33 years (range 15-55 years). The commonest presentations were cough (100%), fever (68%), sputum (64%) and tiredness (58%).

Table shows the resistance against first line drugs. Sensitivity against Rifamycin was available in 44 patients and all isolates were sensitive. MDR was seen in 02(04%).

Table shows the resistance against first line drugs. Sensitivity against Rifamycin was available in 44 patients and all isolates were sensitive. MDR was seen in 02(04%).

<table>
<thead>
<tr>
<th>Anti-TB Drugs</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptomycin</td>
<td>13/50(26%)</td>
</tr>
<tr>
<td>INH</td>
<td>08/50 (16%)</td>
</tr>
<tr>
<td>Ethambutol</td>
<td>08/50 (16%)</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>04/50 (08%)</td>
</tr>
<tr>
<td>Pyrazinamide</td>
<td>01/50 (02%)</td>
</tr>
</tbody>
</table>
against both streptomycin and Isoniazid.

Discussion

This study has shown significant resistance against first line drugs. The resistance against streptomycin is highest (26%), followed by INH (Isonicotinic acid hydrazide) and Ethambutol (16% each). This high resistance is alarming and could be due to the use of these drugs for a longer duration. Other reasons could be erratic prescriptions by health care providers, manipulation of medications by the patients, increase use of INH and Ethambutol in the continuation phase and indiscriminate use of streptomycin by General Practitioners and health care providers for conditions other than tuberculosis.

The locally reported data about resistance against INH (13.3 to 16%) correlates with our study. Sadique and Suhail have reported low resistance against Ethambutol (Zero%) and Streptomycin (3.7% & 11%), which is unreliable because of small sample size in their study. It is recommended that to determine low resistance rate, surveillance of large sample size is needed i.e. 300-600 specimens.5

In this study, the resistance against one or more first line drugs is 50% which is high in comparison to the reported 17% and 24% by Khan (1993) and Rano Mal et al (2000) respectively. Both of these reported studies were done in Karachi so it seems likely to represent the same population. Sohail Akhtar7 in his series (January 1999 to March 2003) reported primary MDR. Recently Seema et al from Karachi (January - September 2004) reported 10% primary MDR. In other parts of the world the reported MDR tuberculosis ranged 9.3%, 10.4%, 12.2%, 13.2% and 14.2% from Latvia, Liao ning, China, Estonia, Uzbekistan and Kazakhstan respectively. In India it is 0.5-2.8%.9

The possible reasons for the increase in resistance in our country are poor compliance, ignorance on the part of patients, over the counter sale of anti-tuberculosis drugs, poor quality anti-TB drugs, unpredictable supply of anti-TB drugs in public hospitals and non-standardized regimens. Masroor et al reported that low socioeconomic status, improper dose schedule, under dosage and lack of health education apparently seemed to be responsible for most cases of drug resistance. Ziaullah et al reported his drug-resistant cases to be among low socioeconomic status people. He added that ninety-five percent of cases had a history of treatment at least once, hence concluded that the resistance was of acquired type.

It has been reported that Pakistan has achieved 100% DOTS (Directly Observed Treatment Short course) coverage in public sector in May 2005 heading towards a hope for controlling TB. But at the same time there is a need to involve Private Practitioners with the Provincial TB Control Program (Public Private Partnership) in an organized line because it is estimated that from amongst the TB patients seeking treatment approximately 80% initially report to their private practitioners for their diagnosis and treatment.

The weaknesses of this study are: small sample size, hospital-based study and lack of a reference laboratory.

Conclusion

There is high prevalence of primary resistance against streptomycin, INH and Ethambutol. The small sample size could not allow generalizing these results.
There is an urgent need to evaluate nationwide primary resistance pattern so that strategy in the treatment of tuberculosis be planned especially the use of Ethambutol and INH in the continuation phase of category-I treatment.

References

Original Article

Causes of amblyopia in children coming to ophthalmology out patient department
Khyber Teaching Hospital, Peshawar

Sadia Sethi¹, Mohammad Junaid Sethi², Ibrar Hussain³, Naimatullah Khan Kundi⁴
Khyber Teaching Hospital¹,³,⁴, Peshawar, District Head Quarter Hospital², Landikotal.

Abstract

Objective: To find the causes of amblyopia in patients 4 to 14 years old attending out patient Ophthalmology department of Khyber teaching Hospital Peshawar.

Methods: In this prospective cohort hospital based study 200 children aged 4-14 years were studied over a period of 12 months from December 2005 to November 2006 in outpatient department of Ophthalmology, Khyber Teaching Hospital. Visual acuity was checked with Snellen's and Lea symbols depending on level of cooperation of patient. Cycloplegic refraction and orthoptic assessment was performed on all patients. Amblyopia was classified as strabismic, anisometric, combined and stimulus deprivation. Treatment consisted of optical correction, patching, atropinization and surgery.

Results: Out of 200 patients 126(63%) were male and 74 (37%) were female, 114 (57%) were in age group 4-9 years while 86 (43%) were between 10-14 years. Strabismic amblyopia was present in 110 (55%), Anisometric amblyopia in 42 (21%), combined mechanism amblyopia in 32 (16%), ammetropia in 12 (6%) and stimulus deprivation amblyopia in 4 (2%) Binocularity could not be assessed in 16 (8%), was present in 38 (19%) and absent in 148 (73%).

Conclusion: Amblyopia was more common in males than females. Most of the children presented in younger age group of 4-9 years. Strabismic amblyopia was the most common cause of amblyopia. Amblyopia was more common in esotropes than exotropes. Half of the patients had moderate amblyopia, while the remaining were suffering from either mild or severe amblyopia. Binocularity was absent in 73% of the patients (JPMA 58:125;2008).

Introduction

Amblyopia is classically defined as a reduction in corrected visual acuity (VA) in absence of visible organic abnormalities and is due to misdirected, blurred, or absent retinal images during development of visual system.¹ It is the most frequent cause of monocular visual impairment in both young and adults.² The causes of amblyopia include strabismus, anisometropia, high refractive error, media opacities, high astigmatism or combination of two or more etiologies in the same patient. Strabismic amblyopia is the most common form of amblyopia which develops in consistently deviating eye of the child with ocular misalignment. Constant or alternate tropias (typically esodeviations) are most likely