Short Communication

PREVALENCE OF MULTIDRUG RESISTANT TUBERCULOSIS IN REMOTE AREAS OF FAISALABAD

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INTRODUCTION:

Tuberculosis is an infectious bacterial disease caused by Mycobacterial Tuberculosis, which most commonly affects the lungs. It is transmitted from person to person via droplets from the throat and lungs of people with the active respiratory disease [1]. Disease of the poor, such as tuberculosis and other infectious diseases are major concerns in Pakistan as 45% of deaths are attributable to communicable diseases. Tuberculosis is one of the major public health problems in Pakistan. Pakistan ranks sixth amongst the Tuberculosis high burden countries in the world and harbors63% of the Tuberculosis burden in Eastern Mediterranean Region of WHO. Approximately 420,000 new Tuberculosis cases emerge every year and among those half are sputum smear positive. The country has an incidence of 177/100,000 population or around 250,000 new cases every year. The prevalence of disease is much higher and is estimated at 1.5 million people. The Health Policy of Pakistan formulated in the year 2001 makes a direct reference for controlling the disease in Pakistan using the WHO recommended strategy of directly observed short course(DOTS)[2].Prevalence of Tuberculosis disease is an important epidemiological index to measure the burden of disease in a community. Epidemiological information on Tuberculosis is also vital for planning of control strategies and service delivery system [3]. Reports of Tuberculosis cases with severe patterns of drug resistance are increasing said expert who attended WHO meeting in Geneva on 21-22March 2012. Participants stressed that the emergence of drug resistance should be a wake-up call for ministries of health. The group urged that the global Tuberculosis community to make greater efforts to prevent drug resistance and scale up provision of appropriate care and management to avoid a scenario where Tuberculosis become incurable [4].

Multidrug resistant Tuberculosis is a possible threat to global tuberculosis control. Despite a disease prevalence of 263/100,000 populations Pakistan lacks information on prevalence of drug resistant Tuberculosis. Our objective was to estimate prevalence of multidrug resistant Tuberculosis in remote areas of Faisalabad due to its progressively increasing incidence despite of national and international preventive measures.

MATERIALS AND METHODS:

A questionnaire-based study was conducted among patients of multi drug resistant tuberculosis in DHQ AND PRIVATE HOSPITAL in FAISALABAD. After taking consent to participate in study, a questionnaire based study was done. Full confidentiality of information gathered was ensured to all the study participants and also assured that results of this study would not be presented on individual level. Questionnaire, consisting of basic demographic characteristics about participants and question regarding their knowledge about tuberculosis and its interpretation were filled by respondents. A total 22 questions were asked and 20-30 minutes were needed to respond to questions. Data of 22 questions was analyzed using SPSS version 20.0 evaluation facility. Percentages and 95% confidence interval for each variable was calculated .Chi-square was used to measure significant difference between male and females, keeping level of significance at 0.05.

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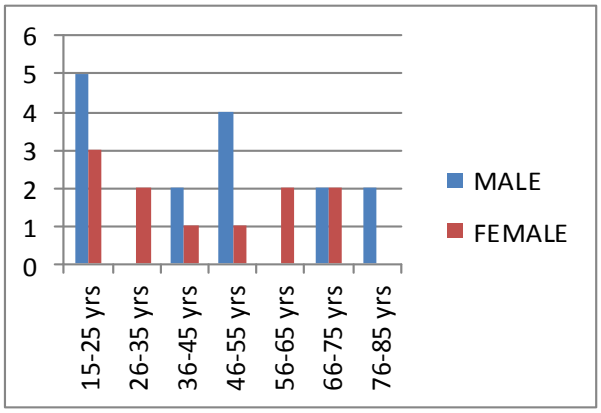
Ratio Statistics for knowledge / treatment

Group	Mean	95% Confidence Interval for Mean		Median		95% Confidence Interval for Median	Coefficient of Dispersion		Coefficient of Variation
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Actual Coverage	Median Centered	Lower Bound	Upper Bound	Lower Bound
Yes	1.000	1.000	1.000	1.000	1.000	1.000	100.0%	.000	.0%
No	1.109	.903	1.314	1.000	1.000	1.000	96.5%	.152	48.9%
Overall	1.096	.915	1.277	1.000	1.000	1.000	97.1%	.135	45.8%

RESULTS:

The confidence interval for the median is constructed without any distribution assumptions. The actual coverage level may be greater than the specified level. Other confidence intervals are constructed by assuming a Normal distribution for the ratios.
The result showed p-value <0.05 with calculated confidence interval of 95%. Our study group included 26 samples, with age from 15 to 85 years. Male to female ratio 1.3 : 1 , with higher incidence of multidrug resistant cases seen in age group 15-25 nearside 30.76% ,shown in fig 5:
The variables which were measured in order to identify factors associated with increase in prevalence of multidrug resistant tuberculosis were



1) demographic; ,sex, age
2) socioeconomic, size ,social stratum of locality ,indicators related to households—number of inhabitants and rooms, ventilation of rooms, utensils etc.
3) access to health care facilities
4) MDR-TB or TB related past clinical history,
5) duration of treatment(if left then why?)etc.
6) association of diabetes or use of steroids with treatment of tuberculosis.
7) compliance with treatment. Our study showed lack of awareness, poor treatment compliance, poor health surveillance(tuberculosis in particular), non availability of all second line drugs, as the key contributing factors towards increasing prevalence of multidrug resistant tuberculosis.

DISCUSSION:

Tuberculosis a ubiquitous, highly contagious chronic granulomatous bacterial infection, is still a leading killer of young adults worldwide. Tuberculosis has returned with a new face and global scourge and now multidrug resistant tuberculosis is reaching towards epidemic proportions[5].

MDR-TB:

Multi drug resistant (MDR) TB is the most severe form of TB as the bacilli are resistant to both isoniazid and rifampicin, irrespective of resistance to other drugs.

PRIMARY (INITIAL) RESISTANCE:

occurs in persons who have not received any anti-TB therapy and they are initially infected with drug resistant strains**.**

SECONDARY (ACQUIRED) RESISTANCE

occurs in patients who have previously received anti-TB therapy and resistance develops as a result of inadequate regimen. It is relevant to differentiate primary from secondary resistance since primary resistance is less severe, often to one drug and with lower level of resistance (MIC) to individual drugs. Secondary resistance, on the other

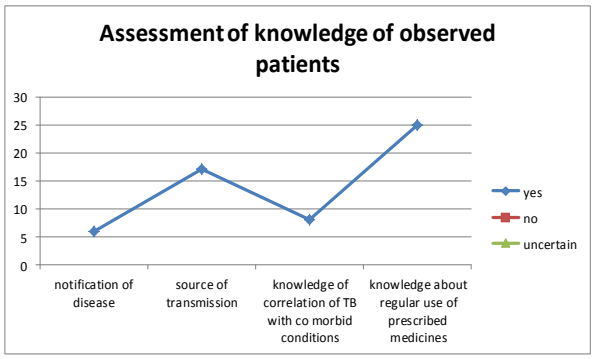
hand, is more severe and often to 2 or more drugs[6].

Tuberculosis has caused 1.8 million deaths annually .Majority of cases are found in low or low middle income countries[7].Our study was the first of its kind to be conducted in Faisalabad, others were conducted in big cities like Karachi and Islamabad in urban setup. As the disease is very much common in Faisalabad and no active measures have been taken to combat this disease in Faisalabad in spite of increasing prevalence, so our focus was to identify and recognize the pitfalls in preventing this disease. Secondly better formulated drugs are not available which further complicates this rising enigma.

Mycobacterium tuberculosis like all microbes is a hybrid from purely histologic perspective. Mycobacterium tuberculosis is characterized as slow growing and successful pathogen that bear 'natural' capacities for evading detection and developing antibiotic resistance, due to this fact in the late 1980's and 1990's ,the rate of tuberculosis and multidrug resistant tuberculosis spiked so dramatically that in 1993 WHO has declared a global TB emergency. This is not because strains of mycobacterium tuberculosis are 'successful pathogens' in essential biological sense but because patterns of resistance are shaped by dynamics of human-microbe relationships, such as political debate about appropriate treatment ,poverty and public health neglect, following fig .1&2 shows general health consideration among MDR-TB affected cases.

One out of every 3 individuals worldwide is infected with mycobacterium tuberculosis and WHO estimates one individual is newly infected every second ,that one person dies from tuberculosis every 20 seconds[8].

Fig .1



To control this emerging menace of multi drug resistance tuberculosis, DOTS was introduced as a global strategy**.**

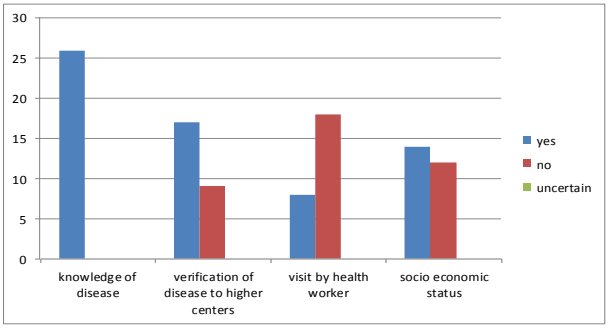
DOTS COMPRISES FIVE KEY COMPONENTS.

(1) political commitment
(2) case detection through quality assured bacteriology
(3) standardized treatment and patient support
(4) an effective drug supply and management system
(5) monitoring and evaluation system and impact measurement[9] .

It is still seen as corner stone of tuberculosis control today, its success is largely measured through case detection and treatment success rates. **Case detection** requires that tuberculosis is primarily diagnosed in a patient through bacteriology and is reported within the national surveillance system and hence to WHO. Treatment success is achieved when a patient who was sputum smear positive completes treatment (they become smear negative) or when a patient who was smear negative completes treatment. Antibiotics themselves are the source of evolutionary pressure that eventually renders them obsolete. Following fig.3shows assessment of correlation of treatment compliance and its contribution towards increasing prevalence of MDR-TB.

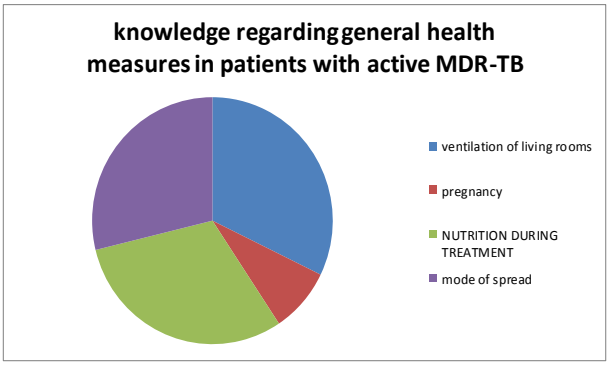
Fig.3

Limiting exposure of microbes to antibiotics



therefore makes good sense to reduce the opportunity for selection and dissemination of resistance[11]. It also takes into account general health consideration by suspects of MDR-TB as well as by potential contacts. Fig 4

shows such health consideration in differing scenarios observed by questionnaire method during this study.



The in appropriate use of antibiotics by clinicians and agricultural community needs to be curtailed .over the past several years the medical community in particular has made concrete efforts to curb the improper use of antibiotics [12],[13]. Antibiotic resistance is not caused by single factor of un justified or improper use of antibiotics instead DOTS may conceal instead of revealing many of the observable facts of multidrug resistance tuberculosis.[14],[15].

CONCLUSION:

There is no question that multi drug resistant tuberculosis is a pervasive disease in human population and a co-resident in one third of world's human bodies. Our study shows an insight to growing problem despite national and international preventive measures. Hence measures should be taken to combat this emerging health emergency before it becomes incurable.

SUGGESTION:

1) Increase TB case detection
2) Improve TB treatment outcome
3) Enhance access and equity
4) Reduce financial burden on patients
5) Make DOTS effective.

LIMITATIONS:

The authors recognized a number of limitations to review methodology as well as limitations to availability and analysis of evidence.1st limitation was lack of standardized methods for assessing complex intervention, further the method we chose for identifying the prevalence of multidrug resistance tuberculosis is open to criticism. We used questionnaire system to assess the prevalence which in practice does not capture importance of different elements of project; whether it is weighted towards case detection or to improve quality of treatment. Others being:

[1] Specific anti biotic resistance tests could not be done due to high cost and further patients belongs to low socio economic groups.

[2]We did not consider use of smoking and alcohol

[3]Failure of case detection as hidden cases were not identified due to lack of awareness on patients' part an poor surveillance by health ministries.

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Fear ALLAH and you will have no cause to fear any one.

Resignation to the Will of ALLAH is the cure of the disease of the heart.

The word of ALLAH is the medicine of the heart.

Lead such a life, that, when you die, the people may mourn you,
And while you are alive they long for your company.

Hazrat Ali
(Razi Allah Tala Anho)