Reviews Of Progress
ISSN:-2321-3485
DOI : 10.9780/2321-3485/1292013/70
ORIGINAL ARTICLE
Vol - 1, Issue - 29, Nov 13 2013

DRUG RESISTANCE TUBERCULOSIS - AN ALARMING EMERGENCY

Rakesh Chandra Chaurasia

Associate Professor & Head
Dept of Pharmacology
M.L.N Medical College, Allahabad

Abstract:

Tuberculosis is one of the global public health concerns of morbidity and mortality. India shares large number of cases. Concurrent occurrence of HIV infection makes the treatment very difficult.Emergence of antitubercular (ATT) resistance is alarming due to limited number of safe and effective pharmacological agents. Newer agents are comparatively less efficacious and more toxic. Multi drug resistance, extensively drug resistance, and now total drug resistance tuberculosis create problem with conventional pharma cotherapy.

Key words:
Resistance, Pharmacotherapy, Mortality.

Introduction :

Tuberculosis (TB) *'the king of disease*' is mentioned In Indian text 'Ayurveda'. It is one of the diseases resulting into worldwide morbidity and mortality. WHO declares TB as global emergency .For awareness among community towards this deadly disease *'24th march'* is dedicated as *'World TB day'*. Till early four decades of 20th century, effective pharmacotherapy was not available .Treatment were consist of traditional measures such as rest, fresh air and nutritious diet. Sanatorium was places in hilly area specially serve affordable needy persons.

Anti tubercular's - at a glance

Streptomycin was credit as first antitubercular used since 1947. After 2 year para amino salicylic acid (PAS) was introduced. Both of them have their own limitations in terms of toxicity. Introduction of Effective Isoniazid and Pyrazinamide were revolutionary steps in 1952. After the advent of ethambutol in 1961 domiciliary treatment was started. Short course therapy become possible after the additions of refimpicin in 1962.Now a day, agents indicated in other conditions are utilized as anti-tubercular's in special situations.

Antitubercular drugs are categorize as

(i)Standard drugs – Iso Nicotinamide Hydrazide (H), Refampicin(R), Pyrazinamide(Z), Streptomycin (S) and Ethambutol (E)

(ii)Reserve drugs - Flouroqinolones, Macrolide, Aminoglycosides, and Refamycins. Miscellaneous/newer drugs

Treatment strategies

Standard drugs are supposed to be first line drugs in the sense that those are highly efficacious, less toxic, therefore used routinely.

Reserve drugs are comparatively less efficacious and toxic therefore should be reserved for special circumstances such as resistance.

Problems with disease

- A chronic disease
- Slow growing bacilli
- Different subpopulations of bacilli in a lesions- Rapid grower, slow grower and persister
- Shifting of bacilli from one subpopulation to other
- Delayed development of immunity

Problems with pharmacotherapy

- Atypical mycobacterium infection , resistant to available antitubercular
- Drug resistance tuberculosis
- Poor patient compliance due to long therapy and drugs toxicity
- Defaulter. Relapse or non responsiveness.

Resistance

Resistance is simply 'non responsiveness' to pharmacological agents. Mutation is main reasons of resistance among bacilli. In resistant strains there is reduce penetration of drug inside or there is over production of enzymes that are usually inhibited by drug. INH & R are dangerous in this context because these are only drugs recommended through out therapy (intensive as well as continuations phase) There combination is synergistic as well as preventing the resistance. Other first line agents are also prone to resistance.

Resistance terminologies

Regarding to resistance, there are two well known entities – MDR & XDR. TDR is new entry.

MDR (multi drug resistance) TB is resistance to commonly used first line drug i.e. Isoniazid and refampicin with / without to other first line drugs. In other words, MDR TB means resistance with first line drugs only.

XDR (extensively drug resistance) TB - In addition to MDR, mycobacterium are resistant to second line fluoroquinolone and injectable aminoglycosides. Thus XDR TB shows resistance to first line as well as second line drugs.

TDR (total drug resistance) TB here mycobacterium are resistance to virtually all the currently available first as well as second line anti tubercular drugs.

Current scenario

Since the 1980 the prevalence of MDR-TB and XDR-TB has been increasing at an alarming rate. Introduction of HIV also provides opportunity to bacilli thus making treatment more difficult. In the track of resistance the new addition is TDR i.e. ***total drug resistance tuberculosis*** .In TDR -TB the mycobacterium are resistance to virtually all the currently available anti tubercular drugs. Mumbai has been in world focus years back, after dozen of TDR –TB cases reported. Later scattered cases of TDR –TB are reported from other part .Luckily, India is the third country to get this honor next to Italy (2006) and Iran (2009).

Conclusion-

Effective anti tubercular's (first line) were developed half century back .Their constant exposer from several decades also increases risk of resistance. MDR. XDR and TDR TB are different forms of resistance .Isoniazid and refampicin are safe, efficacious and resistance preventing thus used routinely through-out the course of treatment but their resistance will divert toward reserve option which are comparatively more toxic and less efficacious .Further their resistance may close all the doors of hope. A sophisticated way to assesses specific resistance is not widely available .On the other side, the disease may progresses toward fatal end till the other ways awaited.

References –

- George M Brenner, Craig W Stevens. Antimycobacterial Drugs , Pharmacology , Saunders publication , (Elsevier),3e,2010 ,4532
- Times of India, Jan 2012.
- Satosker , Bhandarker ,Rage; Tuberculosis -Drug Resistances ;Pharmacology & Therapetics ; Papular Prakashan 2012 ; 21;751-752