



Frequently Asked Questions

SYMPTOMS

What is the rationale of three weeks cough as the primary symptom of pulmonary TB?

About 84% of smear positive cases attending health institutions can be detected by screening of chest symptomatics of 3 weeks cough alone, as revealed in operational research studies. Subjecting patients with cough of <3 weeks or those with other chest symptoms to sputum smear microscopy may increase the workload of laboratory by almost three times while adding little to the case yield.

DIAGNOSIS

What is the rationale of collecting three specimens for sputum microscopy?

Of the total smear positive cases presenting at health Institutions, about 69% can be detected by smear examination of first sputum specimen and another 20% by examination of second specimen. The additional case yield by subsequent specimen is minimal. Therefore, a minimum of two specimens should be examined for obtaining acceptable sensitivity of smear microscopy as a case finding tool.

Further, there is likelihood albeit small of single positive sputum smear result to be false positive. However, the chances of two positive results to be false positive are practically non-existent. Therefore, the criteria of at least two smear positive results to label a case as smear positive increases the specificity of the test. Since the bacilli are not excreted consistently in all specimens, at least three specimens should be examined to satisfy the above criterion.

What is the role of X-ray in RNTCP?

Chest X-ray has a role in differential diagnosis of pulmonary disease among chest symptomatic patients whose sputa are consistently negative on smear microscopy.

Why are there so many grades of microscopy while treatment does not change with grading?

Grading assists in quality control and also saves time since fewer fields have to be examined for higher grades. It also assists in monitoring prognosis during course of treatment. A higher proportion of 2+ and 3+ smears are likely to remain

positive at the end of intensive phase and may require additional one month of intensive Phase.

Why should the grading vary from one sample to another in the same patient?

Bacilli are not evenly distributed in a specimen but are found in clumps. (Specimens consistently positive contain at least 10^5 to 10^6 bacilli per ml.

What should be done if scanty positive is the result of smear microscopy among chest symptomatics?

A scanty positive smear result should be supported by another positive smear (more than scanty positive) or by suggestive chest X-ray. Otherwise, repeat sputum collection and smear examination is preferable.

Why a cut off point of one month is considered for labeling a patient as a new case?

Patients with history of treatment of less than one month have been found to respond similarly, as those never treated before. Also, the chances of development of drug resistance with less than one month therapy are remote.

Is there a higher incidence of TB among contacts? What is the role of contact tracing under RNTCP?

Though relative risk of acquiring infection and developing TB is higher among contacts, the case yield from contact tracing is low. However, the risk of breakdown is maximum during the period immediately following infection, especially among children. Therefore, all child contacts and symptomatic adult contacts of smear positive cases, irrespective of the duration of symptoms should be examined at the health centre, to identify and treat TB cases and to provide preventive treatment to children.

Why is priority given to detection and cure of sputum smear positive cases?

Sputum smear positive cases of pulmonary TB are the main sources of transmission of infection. They are responsible for almost 95% of the transmission of infection in the community. They also suffer from more extensive disease and thus are at higher risk of dying. If not treated properly they become the sources of drug resistant bacilli.

CHEMOTHERAPY / TREATMENT ACTIVITIES

Why is it necessary to directly observe treatment?

At least one third of patients receiving self-administered treatment do not adhere to treatment. It is impossible to predict which patients will take medicines regularly. Therefore, directly observed treatment is necessary at least in the initial phase of treatment to ensure adherence and achieve sputum smear conversion. A TB patient missing one attendance can be traced immediately and counseled. No method other than directly observed treatment has been able to achieve 85% cure rate of new smear positive cases.

What is lag period and its use?

The tubercle bacilli when exposed to a drug do not multiply for varying duration, which is called lag period. This property of the bacilli is utilized as the basis of intermittent therapy.

What is the role of each drug during intensive phase?

INH (Isoniazid) has very high early bactericidal activity (EBA) and acts on rapidly multiplying extra-cellular bacilli. It accounts for 95% kill in bacillary population. Remaining bacilli metabolize slowly and are killed preferentially by 'Rifampicin'. INH is also most effective drug for preventing resistance to other drugs. On the other hand, other drugs are not so efficient in preventing resistance to INH, which is therefore more common.

Rifampicin also has high bactericidal activity but starts acting little later. It acts on rapid as well as intermittently (found in caseous lesions) multiplying bacilli.

Pyrazinamide acts on intra-cellular bacilli that are particularly inhibited by acid environment inside macrophages.

Ethambutol is the companion drug to prevent drug resistance.

What is the role of INH and Rifampicin during Continuation Phase?

Rifampicin is the main sterilizing drug in this phase. The role of INH is mainly to prevent drug resistance to Rifampicin.

Why Cat II cannot be given for serious extra-pulmonary cases like TBM¹?

Streptomycin has limited penetration to membranes, however it can be given intra-thecal in case of serious cases of TBM.

¹ tuberculous meningoencephalitis

Why 3 drugs are given during Continuation Phase of Cat II?

The re-treatment cases are more likely to harbour drug resistant bacilli, at least to INH. Therefore, Ethambutol is added to prevent drug resistance to INH or Rifampicin.

Why only 3 drugs are given during Intensive Phase of Cat III?

Smear negativity means there are few bacilli and thus negligible chances of resistant mutant bacilli being present.

Why should we check sputum smear status at 2/3 months?

This information is essential for prolongation of intensive phase by one month, which reduces risk of failure and relapse.

It is an important management tool and reflects on the quality of lab, quality of treatment observation during Intensive Phase and proportion of defaulters.

The smear status at the end of Intensive Phase also predicts the probability of cure.

What is the rationale of switching to continuation phase even if the follow-up smear examination at end of extended Intensive Phase shows presence of AFB²?

With treatment of high efficacy, smears can be positive at 2-3 months due to presence of dead bacilli. Therefore, treatment failure based on smear examination is not considered until 5th month of treatment.

Switching over to self-administered treatment in continuous phase carries a risk of non-adherence as it conveys relaxation in treatment at a time when patients' symptoms are telling that he no longer needs treatment?

The treatment during continuous phase is partially supervised and adherence is sustained by continued motivation and health education of the patient. Operationally, it may not be feasible to supervise each dose of continuation phase. However, all those patients who have a history of being irregular, alcoholics etc., should be fully supervised. Other cases that are willing to be fully supervised during continuous phase should be encouraged.

² acid fast bacilli

Is there a higher risk of failure among those patients who continue to be smear positive at the end of Intensive Phase?

Assuming that the history of previous treatment was taken properly at the time of diagnosis, most patients who continue treatment get cured, though relative risk of failure among such cases is higher compared to those who are smear negative at the end of intensive phase.

In what conditions can Treatment be prolonged?

Continuation Phase may be prolonged up to 7 months with INH & Rifampicin in cases of TBM, Military and Spinal TB

What are the precautions to be undertaken during ATT³?

- (i) Pyridoxine supplementation to pregnant females, diabetics, chronic alcoholics
- (ii) Discourage alcohol consumption during treatment
- (iii) Monitor for symptoms and signs consistent with hepatic damage
- (iv) Liver function tests every 2 - 3 months for those at high risk
- (v) Streptomycin is contra - indicated during pregnancy
- (vi) Monitor side effects of streptomycin specially in elderly: tinnitus, vertigo, hearing tests for higher frequencies which are affected first
- (vii) Avoid loop diuretics, which potentiate side effects of 'Streptomycin'.
- (viii) Analgesics for arthralgia which usually does not require withdrawal of anti-TB treatment.
- (ix) In case of suspected preexisting ophthalmologic disease, assess visual acuity and colour vision before starting treatment
- (x) Stop ethambutol in case of side effects, which are reversible
- (xi) Avoid ethambutol among children < 6 years
- (xii) Avoid 'Streptomycin' and 'Ethambutol' in renal disease
- (xiii) Avoid Antacids that decrease drug absorption
- (xiv) Women to use non-hormonal contraceptive methods

³ Anti-Tuberculosis Treatment

(xv) In case of hypersensitivity reaction, withdraw treatment completely and desensitize later

(xvi) Monitor steroids, oral anti-coagulants, anti-convulsants, oral hypoglycaemics, tranquilizers, theophylline, beta-blockers, calcium channel blockers, digoxin when given concurrently with Rifampicin.

Evaluate each patient by interview and clinical examination for emergence of side effects at the end of each month.

What are the problems in treatment with second line drugs?

(i) These drugs are less efficacious and more toxic.

(ii) They possess cross resistance to first line drugs

(iii) Most patients needing such treatment are difficult to hold e.g. alcoholics, drug addicts, migrants etc,

(iv) Hospitalization is a must for observation and regularizing treatment. Ambulatory treatment is possible only after tolerance and regularity assured.

(v) It is irrational for any country to divert resources to treating with second line drugs until full potential of SCC⁴ regimen has been achieved.

Requirement of the reserve drugs indicates poor program.

What are the guidelines for treatment of TB among children?

If a child is diagnosed to have tuberculosis, a full course of treatment has to be given. Children rarely suffer from smear positive disease. As a result, there are few bacilli in the lesions and no chance of resistant mutants being present. The recommended regimen is Cat III. The dose of drug has to be calculated in mg per kg body weight and given from loose drug stock. For patients with military or meningeal TB, a fourth drug, streptomycin can be added and the total duration made to 9 months.

Why is it necessary to carefully elicit history of previous treatment?

The history of previous treatment should be elicited clearly for deciding on the proper category of treatment for the patient. Otherwise, cases may be given wrong treatment that may lead to treatment failure.

⁴ short-course chemotherapy

How to treat TB patient also suffering from liver disease?

In chronic liver disease, 2 EHRZ / 6 HR can be given unless there is severe liver damage. If ascitis and portal hypertension are present, treat with 2 SHE / 10 HE.

In case of acute hepatitis, the treatment may be deferred. If TB is serious, treat with 3 SE or 3 SE + ofloxacin followed by 6 HR when hepatitis is recovered.

What to do if jaundice develops in a case during treatment?

Stop all drugs and monitor serum transaminases. Usually treatment can be re-started with the same regimen after the serum levels of transaminases return to normal. In serious cases, Ethambutol and Streptomycin which are least hepatotoxic can be given.

How to treat TB patients also suffering from Renal Failure?

Drugs eliminated by non-renal routes – INH, Rifampicin, Pyrazinamide and Thioamides may be given in normal doses.

2 HRZ / 4 HR is safe.

Decrease dose of Streptomycin & Ethambutol and adjust by renal function tests.

HIV & TB

How does the presentation of TB differ in HIV positive cases?

Cough is reported less frequently among HIV positive TB cases, since there is less cavitation, inflammation and endo-bronchial irritation because of impaired cellular immunity.

Majority of HIV positive pulmonary TB cases is smear positive though their proportion is less than among HIV negative pulmonary TB cases.

The main types of Extra-pulmonary TB seen among HIV positive patients are - lymphadenopathy, pleural effusion, pericardial effusion, miliary TB⁵ and tuberculous bacteraemia.

⁵ disseminated, or **miliary TB**, so named because the lung lesions so-formed resemble millet seeds on x-ray.

What are the general guidelines for treatment among HIV positive TB patients?

Same regimen is used, as for HIV negative TB cases, since sputum conversion rates and cure rates are similar if effective chemotherapy is given. However, the treatment in Continuation Phase should also be fully supervised since lower rates of adherence and higher fatality rates have been observed among such patients.

PREVENTION AND CONTROL

Is there any role for preventive therapy under RNTCP?

Risk of breakdown from infection to disease is maximum during the period immediately following infection especially among young children. So, asymptomatic child contacts less than 6 years old are routinely recommended chemoprophylaxis.

How do you foresee the role of RNTCP in preventing MDRTB⁶?

The only effective means of preventing MDRTB is to prevent emergence of such cases by DOTS. The proportion of cases with MDR has been demonstrated to come down with implementation of DOTS, in a number of places all over the world viz. Texas, New York, Peru. In Botswana where DOTS is being implemented, the proportion of MDRTB is one twentieth of that in other African countries where DOTS is not being implemented. At RNTCP sites in India, the proportion of patients put on cat II has been seen to reduce gradually. Experience shows if we make sure that patients receive every dose of drugs, the emergence of MDR TB can be prevented.

What is the role of BCG in TB control?

BCG prevents childhood form of TB like disseminated and miliary TB, but has no role in preventing TB in adults especially cavitary forms.

EVALUATION

How can we evaluate the impact of RNTCP?

Because of high cure rates, the proportion of re-treatment cases should decrease. There should be decline in prevalence of initial drug resistance.

In the community, the impact of any change in disease situation is first reflected in a change in annual risk of infection (ARI) rates. Therefore, repeated ARI

⁶ Multi-Drug Resistant TB

surveys along with age distribution of cases can be relied upon for assessment of disease trends in the community.

The decline in prevalence of disease occurs next and decline in disease incidence takes much longer.

What is the projected future scenario of tuberculosis in our country?

Demographic changes like increasing life expectancy, population growth, deterioration of living conditions in urban areas like over-crowding and epidemiological factors like HIV epidemic are expected to increase the incidence of TB, unless TB control efforts are intensified on a war footing. Poor treatment practices if continued may contribute to epidemic of multi-drug resistant TB (MDRTB) making the disease virtually incurable.

Fortunately, the 'DOTS strategy' now being expanded in the country has shown promise in terms of cure of infectious cases and hopes have been aroused of its control provided the strategy is implemented with full vigour.

More online on <http://www.who.int/topics/tuberculosis/en/>