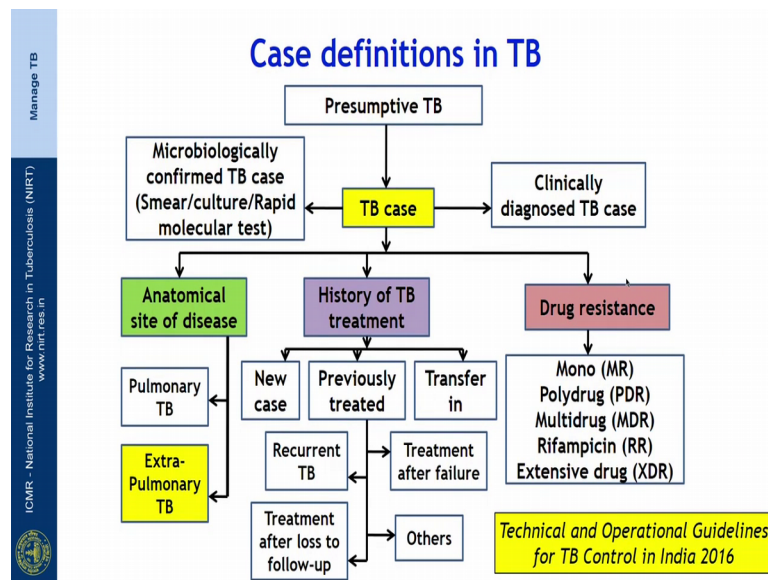


Manage TB
Dr. A. Mahilmaran
National Institute for Research in Tuberculosis, Chennai

Lecture - 38
Management of Extra Pulmonary TB
Session 01

Good morning I am Professor Doctor A. Michael Mahilmaran HOD of Madras Medical College Chennai, and the director Institute of Thoracic Medicine. Today we are going to take your topic on the management of Extra Pulmonary TB. So, all of us know even that the time of diagnosis right.

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TB diagnosis is a very complicated one in extra pulmonary TB, because we cannot confirm all cases as microbiological confirmed case. So, to diagnose TB case we have to first write to as far as possible to confirm it microbiologically by sphere culture, or rapid molecular test ok. Then we have tried to do a clinically diagnosed TB, which is mostly is the commonest in extra pulmonary TB. Once you know it is a TB case, we have to know whether it is a patient who is already taken a treatment or it is a new case or it is a drug resistant TB.

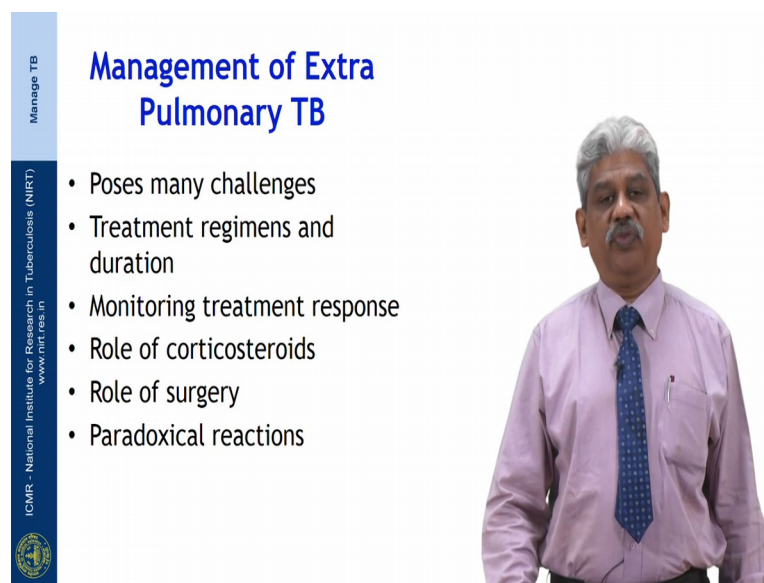
Normally, history of TB is the way where we find out whether the new case or a previously treated, or a patient who has come from somewhere with already diagnose TB. Once you know it is a previously treated case we should know whether it is a

recurrence of the TB that is what we call it as a relapse, or it is a treatment after last to follow up. Most of the cases you would have taken treatment for more than 1 month, and then come to you later defaulting, the therapy and coming to you, so then it case of large to follow.

Similarly, that might be some patients who have run a treatment failure, because most of the TB cases they have to have good responses within 2 to 3 months. Let us say even after 5 months from TB therapy, there is no good clinical or any microbiology confirmed responds, then we call it as a treatment after failure.

And on day 1 itself nowadays with good molecular technologies or we can even diagnose drug resistance very quickly like mono drug resistant, poly drug resistant, or just RIF resistance alone or MDR TB, or XDR. MDR all of them you would have been already been told about that.

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The slide features a vertical blue bar on the left with the text 'Manage TB' at the top, 'ICMR - National Institute for Research in Tuberculosis (NIRT)' in the middle, and 'www.nirt.res.in' at the bottom. The main title is 'Management of Extra Pulmonary TB'. Below the title is a bulleted list of challenges. To the right of the list is a photograph of a man with grey hair and a mustache, wearing a light purple shirt and a blue patterned tie.

Management of Extra Pulmonary TB

- Poses many challenges
- Treatment regimens and duration
- Monitoring treatment response
- Role of corticosteroids
- Role of surgery
- Paradoxical reactions

So, once you know that you have a you have a confirmed case of a extra pulmonary TB, management is the most important thing in extra pulmonary TB. So, it is not very different from other places ok. So, in what are the challenges which will face? The treatment regimen is the same, but the duration of therapy is a little different.

Then monitoring of a patient who is taking treatment is very important because we have to know whether he has a good response to the therapy or not because we still do not have all patients confirmed to be microbiological positive and still be monitoring them.

The most text important thing is the role of steroids. So, pulmonary TB we do not have much role of steroids, but in extra pulmonary TB we have some patients who will do well for steroid therapy. Then the fifth important thing is surgery. So, most of the patients who the extra pulmonary TB might develop during the therapy itself some complications or because of they also sequelae, they might need surgical management. And the most important thing is paradoxical reaction. So, let us look at all these problems in our patients.


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Treatment regimens for drug susceptible TB

Type of TB patient	Intensive phase	Continuation phase
New	2 H,R,Z,E	4 H,R,E
Previously treated	2 H,R,Z,E,S + 1 H,R,Z,E	5 H,R,E

H-Isoniazid; R-Rifampicin;
 Z-Pyrazinamide; E-Ethambutol;
 S- Streptomycin



So, the first and most important thing is the therapy like in extra pulmonary TB all new TB patients have to have a 6 months therapy with isoniazid, rifampicin, ethambutol, and pyrazinamide daily for the first 2 months followed by 4 months of isoniazid, rifampicin, and ethambutol. Why we have added ethambutol is because there is a high level of primary drug resistance even to INH in our country. So, we want do not want to have acquired drug resistance to reformation.

Then for previously treated patients the regimen is for 8 month course with S M for the first 2 months and the all the other for drugs followed by 5 months of ins information and ethambutol. So, this is a common regimen which we all follow.

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Drug Dosages for Adult TB

Drug	Recommended dose	
	Daily	
	mg/kg body weight	maximum (mg)
Isoniazid	5 (4-6)	300
Rifampicin	10 (8-12)	600
Pyrazinamide	25 (20-30)	--
Ethambutol	15 (15-20)	--
Streptomycin	15 (12-18)	--

ICMR - National Institute for Research in Tuberculosis (NIRT)
www.nirt.res.in

WHO, Treatment of TB Guidelines 2010 4th edition
WHO, Guidelines for treatment of drug-susceptible tuberculosis and patient care 2017 update



So, depending upon the we have to have the proper dosage as far as the daily regimens are concerned. It is not like in those days when we were giving intermittent therapy. So, for INH it is 5 milligram, for rifampicin is 10 milligram, and ethambutol it is 15 milligrams, streptomycin it is 15 milligram, and pyrazinamide it is 25 milligram.

So, at the most in INH and reformation you have to have it has only 300 milligram the maximum dose and in for rifampicin 600 milligram whatever the weight is. Let us say a patient is 70 kg, even you cannot give 700 milligram of refampicin, you have to give a 600 milligrams of rifampicin right. And some of these things you can even have a substitution.

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Dosage of anti-TB drugs (using FDCs)

Weight category	Number of tablets (FDC)		Inj SM (gm)
	Intensive phase	Continuation phase	
	HRZE	HRE	
	75/150/400/275	75/150/275	
25 - 39 Kg	2	2	0.5
40 - 54 Kg	3	3	0.75
55 - 69 Kg	4	4	1
>70 Kg	5	5	1

- Patients aged > 50 yrs, max. dosage of SM 0.75gm
- Body weight < 25 Kg, loose drugs as per body weight

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Technical and Operational Guidelines for TB Control in India 2016



So, most of the patients which we are now treating in the national program RNTCP we have typical fixed dose drug combination we call it as FDC, that is fixed drug combination which comes as tablets for 15 kg body weight patients. So, each tablet is equivalent to 15 kg body weight patient. So, all patients who are in the 25 to 29 you will get 2 tablets, once they are 30 to 45 it will be 3 tablets, once they are more than 50 to 60 it is will be 4 tablets, and after 70 it will be 5 tablets.

You can modify the dose of streptomycin in elderly. Because more than 50 years; the chance of them developing autotoxicity and vestibular problem is very high. So, you have to reduce the dose in most of your adult population by updates by 250 milligrams dose.

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Duration of treatment for new Extra Pulmonary TB

Type	Duration* (months)
Lymph node TB	6
Abdominal TB	6
Pleural TB	6
TB pericarditis	6
Urogenital TB	6
Female genital TB	6
Cutaneous TB	6

*Extention of duration of treatment to be decided by treating clinician

Index TB guidelines, 2016



So the next important thing as I told you most of your pulmonary TB you give the duration of therapy only for 6 months, but for extra pulmonary. When there are has a group of patients who are we call it as seriously ill extra pulmonary TB, the duration of therapy is a little higher.

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Duration of treatment for new Extra Pulmonary TB

Type	Duration* (months)
Ocular TB	6 to 9
TB meningitis*	9 to 12
CNS tuberculoma	9 to 12
ENT TB	6 to 9
Spinal TB	12 to 18
Bone and joint TB	12 to 18

*Pyrazinamide can replace Ethambutol in CP
Streptomycin can replace Ethambutol in IP in vision impairment or if vision is not assessed

Index TB guidelines, 2016



But for all cases especially lymph node TB, abdominal TB, pericardial TB, and euro genital TB, female genital tract TB, and cutaneous TB where the bacillary load is very less the duration of therapy is for only 6 months. But for patients who have severe forms

of TB like ocular TB, spinal TB, spinal TB with neurological dysfunction, CNS tuberculomas, and TB meningitis, and ENT TB the duration of therapy is a little higher. Especially for spinal and those with bone and joint involvement, but it will be for 1 year to one and half years.


So, if it all extra pulmonary TB depending upon the clinical response you can increase the duration of the continuation phase that is the phase where we give just INH, rifampicin, ethambutol for 3 months to 6 months depending upon the clinical response.

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Indications for surgery in Extra Pulmonary TB

Type	Indication
Ocular TB	Complication of retinal vasculitis, uveitis, Non-resolving vitreous inflammation
TB meningitis	Hydrocephalus with raised intra-cranial pressure
ENT TB	Facial nerve palsy, retro-pharyngeal abscess
TB pericarditis	Cardiac tamponade, constrictive pericardial disease

Index TB guidelines, 2016



So, what are the indications for surgery in extra pulmonary TB? All of you know that patients with retinitis or vitreous involvement will have some loss of vision. So, sometimes it might have to do some surgical procedures as vitrectomy, or let us say he has retinal detachment we have to do some laser surgery.

Similarly in meningitis it is very common for some of the children especially to develop hydrocephalus. So, it can happen as a sequelae to TB meningitis, or even during the inflammatory process. So, to provide that sometimes we use steroids and surgery is a very common indication for reducing the hydrocephalus by doing shunting.

We do a shunting we do a shunting always for most of your hydrocephalus. Then TB pericarditis, TB pericarditis can sometimes lead on to constrictive pericarditis and even

cardiac tamponade. So, once they developed that you need to do a surgery or sometimes to relieve you need to remove the fluid.

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Indications for surgery in Extra Pulmonary TB

Type	Indication
Abdominal TB	Strictures, obstruction, abscesses
Urogenital TB	Strictures, obstruction
Female genital TB	Large residual tubo-ovarian abscess
Spinal TB	Spinal deformity, instability, neurological deficit, Large fluctuant cold abscess

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Then next common as indication is abdominal TB, where most of them will the abdominal TB will develop stricture or sometimes they can even cocoon that is the whole inflammatory process can make the intestine into a cocoon. And produce a sub acute obstruction of the intestine where you need to do surgery for all your patients. Urogenital TB the commonest problem is obstruction or you sometimes you can have obstruction also.

So, nowadays we have catheter based therapy like percutaneous, nephrostomy, we have stenting and all those things which can be as a useful option. In female urogenital TB most of them will have tubo ovarian abscess. What is even after therapy? The tubo ovarian mass size will not reduce so such patients will have a better option of removal of the tubo ovarian mass for better outcomes. And the most important thing is spinal TB, where surgical management as a major role especially let us say a patient with spinal TB later developed severe spinal deformity event corrective surgeries can happen.

And the most important thing is when he is in TB disease if the patient develops spinal paraparesis the most important thing is even before he develops which you have to intervene and stabilize spinal column to prevent the obstruction to the spinal cord to

make him a persistent paraparesis. And the other most less common thing is sometimes when you have a very large paraspinal abscess you have to drain it surgically.

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Role of corticosteroids in Extra Pulmonary TB

- Adverse outcomes in EPTB
 - Neurological disability
 - Fibrotic sequelae - constrictive pericarditis, pleural fibrosis, strictures of hollow viscera like intestine and ureter
- Steroids could avert some of the above outcomes
- Dosage of steroid - 1mg/day for 4 weeks, tapered slowly over next 4 weeks



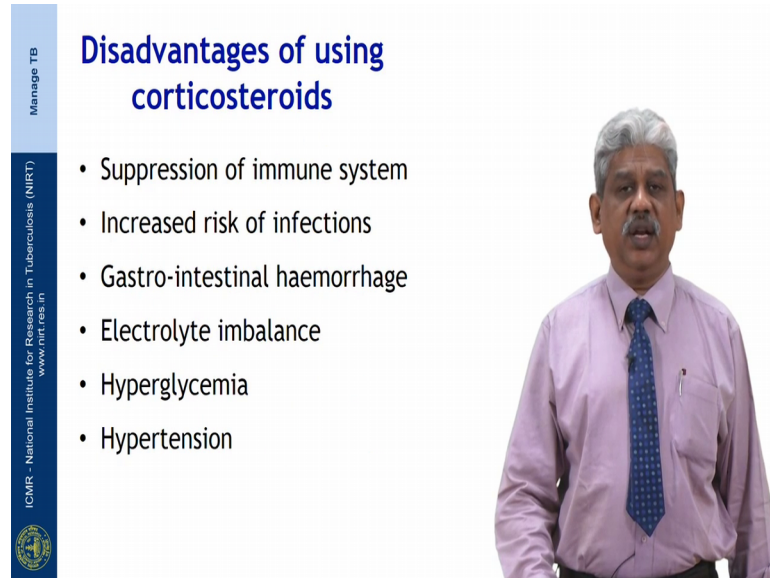
Then what is the role of steroids in extra pulmonary TB? So, why it is used steroids and why we are very afraid of using steroids? There are some conditions where extra pulmonary TB we have adverse outcome right for the neurological disabilities. Especially in spinal tuberculosis the patient can have a compression of the spinal cord by a abscess, or because of a fracture of the spine you can have an compression of the spin, or you can have even anterior spinal artery being obstructed by a vasculitis.

So, all these things are a problem to for a patient to develop paraspinal problems and leading to paraparesis of his lower limb's. So, it is very important that we intervene such patients and try to decompressed the lesion, so that he will now develop a para abscess. Then there is a lot of problems of sequelae like fibrosis. So, it mostly it happens in the intestines ok, so some of them who have TB abdomen with a TB ulcer will develop a stricture leading out to subacute, obstruction of his abdomen.

Similarly, patients you have pericardial effusion, TB pericardial can lead on to constrictive pericarditis and some of the patients who have urogenital TB especially urological TB will develop strictures and you can have a problem. So, steroids can avert some of the about outcomes. So, the dosage of steroids is 1 milligram per kg body

weight for the first 4 weeks. Then slowly taper it off within the next 4 weeks that is therapy will be at the most for 4 months.

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The slide features a vertical blue bar on the left with the text 'Manage TB' at the top, 'ICMR - National Institute for Research in Tuberculosis (NIHT)' in the middle, and 'www.nirt.res.in' at the bottom. The main title is 'Disadvantages of using corticosteroids'. The list of disadvantages includes: Suppression of immune system, Increased risk of infections, Gastro-intestinal haemorrhage, Electrolyte imbalance, Hyperglycemia, and Hypertension. A man in a light purple shirt and blue tie is standing on the right side of the slide.

- Suppression of immune system
- Increased risk of infections
- Gastro-intestinal haemorrhage
- Electrolyte imbalance
- Hyperglycemia
- Hypertension

So, what are the disadvantage of giving a steroid? And why we are more updates of using a steroids is the separation of the immune system. A patient with tuberculosis especially extra pulmonary TB is and severe forms of TB are already immunosuppressed. So, steroids can do a lot of immune suppression that is why we are very apprehensive of using a steroid.


So, then there is a because of that there is an increased risk of infection. So, some of them can develop over long term the complications like hyperglycemia, hypertension. Most of them will have some GI symptoms, or GI bleed and electrolyte imbalance which will happen very early during the treatment of steroids.

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Corticosteroids in TB meningitis

- Decrease inflammation, especially in subarachnoid space
- Reduces cerebral, spinal cord oedema and intracranial pressure
- Reduces inflammation of small blood vessels, and damage due to blood flow slowing to the underlying brain tissue



So, the most important thing and which is been approved throughout the world is corticosteroid in TB meningitis. Because why we use it is? Because we do not want the patient to develop a sequelae because of the TB meningitis; so, steroids help in reducing the inflammation in the subarachnoid space. So, preventing them to develop a hydrocephalus similarly they reduced the cerebral, or spinal edema, and intracranial pressure. So, you do not develop a hydrocephalus.

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Indications for steroid use in EPTB

Type of EPTB	Steroid use
TB meningitis	Recommended in HIV negative and in HIV positive without life threatening OI Duration of 4 weeks with tapering
TB pericarditis	Recommended in pericardial effusion
Ocular TB	Adjunctive - Evidence on benefit insufficient
Addisons Disease	Recommended

Steroids not recommended in pleural TB, ENT TB
- Lack of evidence on benefits

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Similarly, they also reduce the inflammation in the arthritis. So, most of the TB patients will have some type of arthritis because of the immune mediated response. So, those arthritis can be reduced. So, that the brain supply or the spinal supply will be maintained. So, what are the common indications which we use steroid the most important thing is TB meningitis it is recommended for all even HIV positives or HIV negatives, but let us say HIV positive as a severe extra OI, may be we have to consider whether to give steroids.

But most of the HIV patients with TB meningitis should be given to steroids to prevent the hydrocephalus to form. The next important thing is TB pericarditis, where you have a recommendation. So, not all your patients with TB pericarditis need to have, but it is recommended when you feel that he is going might going for a constrictive pericarditis. Then ocular TB it is always recommended because most of them if they have an inflammation and they develop a sequelae like lateral detachment, or vitreous lesion, fibroses and all those things if they are eye vision can be a problem.

So, it is very important that we recommend steroids in all are ocular TB, and all of you know Addison's disease where there is a hypoaldosteronism where all of you would know that you need steroids as a therapy. So, the indications for pleural effusion TB, is not there; so, in those days most of them with TB pleural effusion, were given steroids so you do not give steroids for all your TB pleural effusions now. So, you should be very careful when you give steroids for your TB pleural effusion. Similarly you should not give for ENT which is not recommended.

Thank you.