Received	Modification	Accepted	Published
16/3/2021	---	01/04/2021	12/05/2021

ISSN Print: 2581-8546 ISSN Online: 2582-2934

Review Article

WORLD TUBERCULOSIS DAY-"LET'S STOP TRANSMISSION, WE ARE RUNNING OUT OF TIME"

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ABSTRACT :

Introduction: Research publishing describes the subfield of publishing which distributes academic research and scholarship. Most of research work is published in journal article, book or thesis form. Most scientific and scholarly journals, and many academic and scholarly books, though not all, are based on some form of peer review or editorial refereeing to qualify texts for publication. Peer review quality and selectivity standards vary greatly from journal to journal, publisher to publisher, and field to field.

Keyword : Publication, Utilization, Nursing, Research.

On 24 th of March every year this day is marked to celebrate **WORLD TUBERCULOSIS DAY**

WHY IS THIS CELEBRATED? In 1882 Dr. Robert Koch announced discovery of the bacterium causing TB, and this discovery was a boon in diagnosing ,curing, controlling and elimination of this deadly disease. A century later, March 24 was designated World TB Day: marked as a day to educate the public about the impact of TB around the world.

We should call it as a valuable opportunity rather than celebration until TB is eliminated. It's a day assigned for raising public awareness about the devastating health, social and economic consequences of tuberculosis (TB) and to step up efforts to end the global TB

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THEME OF WORLD TB DAY 2021

Theme is given to highlight a priority area of concern. This year the theme for 2021 is "The Clock Is Ticking."

Heads and representatives of states and governments assembled at the United Nations in New York on 26 September 2018 called as United Nations High Level Meeting. The theme suggests the Stop TB Partnership and all partners that it is alarming time. We need redoubled support to raise awareness and honor commitments and mobilize essentially needed resources to help achieve the UNHLM (United Nations High Level Meeting) targets by 2022. While we focus on COVID-19, every single day 4000 people die and 27 000 people get sick with TB.

So the theme clock is ticking means we are running out of time to achieve our targets.

WHY TUBERCULOSIS A DREADFUL DISEASE

- TB causes enormous socio economic burden.
- It affects people in their most productive years of life.
- Tuberculosis kills women in reproductive age group than all causes of maternal mortality which creates orphans than any other infectious disease.
- One third of female infertility in India is caused by TB.
- Children of tuberculosis patient either drop out from schools or take up employment to help support their families.
- Treatment of TB is long term losing that much income. This loss is even more saddening for those struggling against poverty.
- Since treatment requires 3-4months there may be defaulters of treatment
- Tuberculosis is one of the earliest opportunistic diseases to develop among persons infected with HIV.
- High drug resistance

DOI:10.46376/GNJI/4.I.2021.283-288

ISSN Print: 2581-8546 ISSN Online: 2582-2934

- Poverty, economic recession, malnutrition, overcrowding, tobacco, alcohol abuse and diabetes make population more vulnerable to tuberculosis.

WHAT CAUSES TUBERCULOSIS?

Mycobacteria are small rod-shaped bacilli that can cause a variety of diseases in humans. They can be classified in three main groups:

- Mycobacterium tuberculosis complex: This group includes M. tuberculosis, M. bovis, M. africanum, M. microti, and M. canetti. They all can cause "tuberculosis" in humans. Broadly majority of tuberculosis is caused by M. tuberculosis. Pulmonary tuberculosis is the most commonest with disease also occurring in skin,bones,lymph nodes,abdominal organs and meninges
- Mycobacterium leprae causes leprosy.

M. tuberculosis multiplies more slowly than the majority of bacteria; this is why tuberculosis has a slower evolution (causes disease weeks or even months to years after infection) than most other bacterial infections. They can live inside human body years without causing disease.

M. tuberculosis multiplies better in pulmonary tissue particularly at the apex, where oxygen concentration is higher than in the deeper organs.

WHAT CLINICAL FEATURES A PERSON WITH TUBERCULOSIS DISEASE PRESENTS?

Pulmonary tuberculosis commences with a cough which worsens over time. The cough may produce yellow or green sputum (phlegm) first thing in the morning. Eventually, the sputum is mixed with blood in small amounts.

The lungs are unable to bring enough oxygen to the blood due to the damage caused by bacilli.. Progressive infection causes tiredness and general unwelless as body doesn't get adequate oxygen.

They may lose weight due to loss of appetite.

Pulmonary tuberculosis can also cause night sweats, which is when a person wakes up drenched in sweat. It may or may not cause a fever.

Two other common symptoms of pulmonary tuberculosis are chest pain and breathlessness resulting from pleural effusion.

TB of the bone and the joint

TB bacilli can sit in the bones or the joints and cause pain and swelling of the affected area.

TB of the central nervous system

People with TB meningitis experience drowsiness and lethargy, delayed reactions, difficulty moving their hands or feet and speaking or focusing their eyes.

TB of other places

TB can also infect the abdominal cavity called abdominal TB or koch's abdomen which causes pain in the abdomen, loss of weight, anorexia, recurrent diarrhea, low-grade fever, cough, and distension of the abdomen

HOW TUBERCULOSIS GETS TRANSMITTED?

M. tuberculosis is transmitted through the air, NOT by surface contact. Transmission occurs when a person inhales droplet nuclei containing M. tuberculosis, and the droplet nuclei pass through the mouth or nasal passages, upper respiratory tract, and bronchi to reach the alveoli of the lungs. Tuberculosis is NOT transmitted by fomites like utensils and other articles used by the patient.

Factors that Determine the Probability of Transmission of M. tuberculosis

S.N	FACTOR	DESCRIPTION
	Susceptibility	Immune status of exposed individual
	Infectiousness	Exhalation of more bacilli from the air are more infectious
	Space	Exposure in small enclosed spaces
	Concentration of infectious droplet nuclei	The more droplet nuclei in the air, the more probable that M. tuberculosis will be transmitted
	Ventilation	Inadequate ventilation that results in insufficient dilution or removal of infectious droplet nuclei
	Specimen handling	Improper specimen handling procedures that generate infectious droplet nuclei
	Air Pressure	Positive air pressure in infectious patient's room that causes M. tuberculosis organisms to flow to other areas
	Duration of exposure to a person with infectious TB	The longer the duration of exposure, the higher the risk for transmission
	Frequency of exposure to infectious person	The more frequent the exposure, the higher the risk for transmission
	Physical pro ximity to infectious person	The closer the proximity, the higher the risk for transmission

DOI:10.46376/GNJI/4.I.2021.283-288

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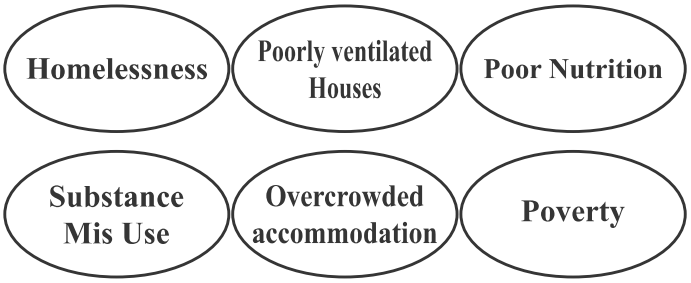
WHO ALL PEOPLE ARE AT RISK OF GETTING TUBERCULOSIS INFECTION WHICH CAN LEAD TO TUBERCULOSIS DISEASE?



HOW TUBERCULOSIS CAN BE TREATED?

Aims of treatment

The aims of treatment of tuberculosis are:

- To cure the patient and restore quality of life and productivity
- To prevent death from active TB or its adverse effects
- To prevent relapse of TB
- To reduce transmission of TB to other people
- To prevent the development and transmission of drug resistance

ESSENTIAL ANTI-TUBERCULAR DRUGS

Drug resistance may occur due to monotherapy so fixed dose combination drugs are used. which may occur with separate drugs.

- With the help of FDC patients cannot be selective in the choice of drugs to ingest.
- Since dosage recommendations are standard therefore prescription errors are less frequent
- Dose Adjustment is made easier according to weight of the patient.
- Bedaquiline is indicated in adults (>18 years) as part of combination therapy of pulmonary TB due to MDR-TB.Adults (>18 years): Bedaquiline should only be administered as part of a MDR-TB regimen. It is recommended that bedaquiline is administered by directly observed therapy (DOT).
- The recommended dosage of bedaquiline for MDR-TB is: Weeks 1 and 2: 400 mg (four tablets of 100 mg) once daily Weeks 3 to 24: 200 mg (two tablets of 100 mg) three times per week (with at least 48 hours between doses).
- The total duration of treatment with bedaquiline is 24 weeks. Bedaquiline should be taken with food.

WHO RECOMMENDED DOSES OF FIRST-LINE ANTITUBERCULOSIS DRUGS FOR ADULTS

Drug	Recommended dose			
	Daily		3 times per week	
	Dose and range (mg/kg body weight)	Maximum (mg)	Dose and range (mg/kg body weight)	Daily maximum (mg)
Isoniazid	5 (4–6)	300	10 (8–12)	900
Rifampicin	10 (8–12)	600	10 (8–12)	600
Pyrazinamide	25 (20–30)	–	35 (30–40)	–
Ethambutol	15 (15–20)	–	30 (25–35)	–
Streptomycin[a]	15 (12–18)		15 (12–18)	1000

***Patients aged over 60 years may not be able to tolerate more than 500–750 mg daily, so some guidelines recommend reduction of the dose to 10 mg/kg per day in patients in this age group (2). Patients weighing less than 50 kg may not tolerate doses above 500–750 mg daily (*W*)**

WHAT WE CAN DO TO PREVENT TUBERCULOSIS?

New WHO recommendations to prevent tuberculosis

- WHO recommends a scale-up of TB preventive treatment among populations at highest risk including household contacts of TB patients, people living with HIV and other people at risk with lowered" immunity or living in crowded settings.
- WHO recommends an integration of TB preventive treatment services into ongoing case finding efforts for active TB. All household contacts of TB patients and people living with HIV are recommended to be screened for active TB. If active TB is ruled out, they should be initiated on TB preventive treatment.
- WHO recommends that either a tuberculin skin test or interferon-gamma release assay (IGRA) be used to test for TB infection. Both tests are helpful to find people more likely to benefit from TB preventive treatment but should not become a barrier to scale-up access. Testing for TB infection is not required before starting TB preventive treatment in people living with HIV, and children under 5 years who are contacts of people with active TB.
- WHO recommends new shorter options for preventive treatment in addition to the widely used 6 months of daily isoniazid. The shorter options that are now recommended range from a 1 month daily regimen of rifapentine plus isoniazid to 3 months weekly rifapentine plus isoniazid, 3 months daily rifampicin plus isoniazid, or 4 months of daily

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rifampicin alone.

We can help prevent TB only by education.

- TB education is necessary for people with TB regarding how to take drugs properly cough etiquettes.
- For general public education is important for knowing basic information about TB and eliminating stigma prevalent among society.

HEALTH CARE PERSONNEL CHALLENGE

I. Ensuring regular intake of all the drugs by the patient to facilitate patient adherence.

II. Establishing and maintaining systems that maximize patient access to care.

III. Training health workers in drug regimen, drug formulations to provide patient-centered care.

PATIENT CHALLENGE

I. Patients have the responsibility of sharing information with the health provider, following treatment, contributing to community health.

II. Patients can reflect solidarity by passing expertise gained during treatment to others in the community.

III. Patients can be involved in stigma reduction activities in the community and supporting treatment completion of other patients thus utilizing first-hand TB experience

SOCIAL MEDIA CHALLENGE

Around the world, 3 people lose their lives to TB every minute. A selfie or photograph that shows 3 people, 3 items, or the number 3

I. Tagging 3 people - friends, family, or colleagues - and challenge them to tag 3 more.

II. The hash tags: #TheClockIsTicking #WorldTBDay can be trended

III. Posting on Twitter, Face book, or Instagram

IV. Urging local authorities to light up landmark clocks or buildings in RED on 24 March 2021 to show their commitment to ending TB.

PEOPLE CHALLENGE

I. Administration of BCG vaccine

II. Cough etiquette and cough hygiene

III. Getting patients & community involved in advocacy campaigns

IV. Improve room air ventilation

V. Safe sputum collection

VI. Rapid TB diagnosis and treatment

POSITIVE ACTION TO REMOVE BARRIERS TO TREATMENT AND CARE

I. Ensuring that all services provided are affordable (if not free), and eliminating cost of care

II. Appropriate patient education, including information regarding the regimen, duration and possible treatment outcomes, provided repeatedly by well-trained and considerate staff

III. Prompt detection and management of adverse drug reactions

IV. Availability of other forms of treatment support (such as community, workplace, or other) when facility-based treatment is an obstacle for the patient

V. Provision or financing of transportation, and other treatment enablers that can compensate patients for the indirect costs of care

VI. Provision of incentives such as food or hygienic packages for patients and their families, if appropriate for the context and for the patient

VII. Referrals for psychological, social and legal support and other services including substance abuse treatment

VIII. Integrated support for TB patients with addictive behaviors

IX. Ready availability of concomitant HIV treatment

MEASURES TO SUPPORT PATIENT ADHERENCE TO REGULAR AND COMPLETE TREATMENT

- A regular supply of drugs provided free of charge
- Drugs allocated in patient kits, to ensure that drugs for the full course of treatment are reserved for the patient at the outset of treatment in fixed-dose combinations and blister packs, to help reduce medication error as well as facilitating adherence.
- Accessible, high-quality, continuous ambulatory TB care
- Expanding treatment outlets in the poorest rural and urban settings and involving providers who practice close to where patients live
- Convenient clinic hours with minimal waiting times
- Adequate numbers of motivated health workers with managerial support

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- Flexibility to make appropriate arrangements for transfer to another facility
- Making arrangements for people released from prison or hospital to continue care on an ambulatory basis in the patient's community.
- Availability of hospitalization for severely ill patients and for those with complications or associated conditions requiring closer clinical monitoring.
- Maximizing the likelihood of locating patients who interrupt treatment.
- Recording mobile telephone numbers for the patient and family
- Where resources permit, it is helpful for a health staff member to accompany the patient to his or her residence. This allows verification of the patient's exact address and provides an opportunity to arrange for screening of household contacts

STOPPING THE TRANSMISSION OF TB FROM ONE ADULT TO ANOTHER

Transmission can be prevented only by taking the entire course of dots treatment

- Anyone who coughs should be educated on cough etiquettes and respiratory hygiene and should follow practices at all times.
- While smear positive ,T.B patients should:-
- Sleep alone in a separate adequately ventilated rooms
- Spend as little time as possible on public transport
- Spend as little time as possible in places where large numbers of people gather together.
- Patients should be encouraged to cover their mouths when coughing. Patient education is an important tool to promote this behavior change.
- Safe sputum disposal habits at home and community

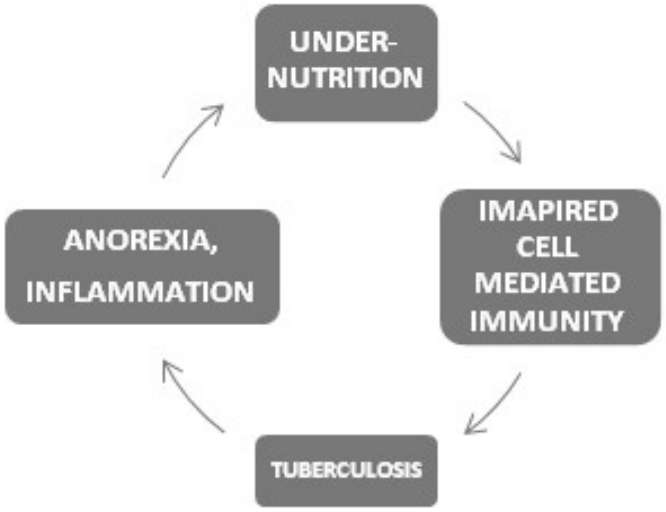
Advise patients to collect the sputum

- Advise patients to collect the sputum in a covered tin container throughout the day. At the end of the day, patients should add a little water to the sputum collected, boil it for 20 minutes, and dispose of it in running water.
- Patients are advised to spit in one of two disposal container options discarded twice a day (morning/wake-up and evening/sunset): 1) a plastic or zinc container that could be at least 2 liters and filled with 1/4 sand and discarded in a pit latrine toilet or buried underground; 2) a 5-liter plastic or zinc container filled halfway through with sand and old newspapers that are burned.

NUTRITIONAL SUPPORT FOR PATIENTS WITH TUBERCULOSIS

IMPROVED NUTRITION HELPS PREVENT TB

- Under nutrition increases the risk of TB .
- It is estimated that under nutrition causes about one quarter of all new TB cases globally.
- Improved global food security would greatly improve TB prevention.
- Nutritional support for undernourished persons with latent TB infection may reduce risk of progression to active disease.



NUTRITIONAL REHABILITATION IS IMPORTANT FOR PEOPLE WITH TB

- TB causes weight-loss and macro- and micronutritional deficiencies.
- The bi-directional association between under nutrition and TB leads to a high prevalence of under nutrition among people with TB.
- Proper TB treatment helps restore normal weight and nutrition.
- Proper nutritional care improves nutritional recovery for people who are undernourished, and therefore helps reduce future health risks.

RULE FOR DIET IN T.B

HIGH CARBOHYDRATES,HIGH PROTEIN AND LOW FATS

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a) Carbohydrate requirements- The proportion of carbohydrates in the diet recommended is 55-75% of total energy intake, and this is derived from intake of cereals, pulses, roots and tubers and vegetables. In between meals snacks should be taken to increase energy intake.

b) Protein requirements The requirements of protein would be 1.2-1.5 g/kg ideal body weight per day. The higher requirement of protein is due to metabolic stress related to the active infectious disease. Proteins should comprise around 10-15% of the total energy intake.

c) Fat requirements -These can comprise 15-30% of total daily energy intake. Fats are present in oils, nuts, milk and milk products, meat. Groundnuts have around 40 percent fat, also being a good source of protein.

d) Micro nutrients -Micronutrients like iron,folic acid,vitamin A,C,D,B12,iodine

STUFFS THAT SHOULD BE AVOIDED

- Alcohol in any form is dangerous for the patient as it increases the risk of drug toxicity. Carbonated drinks.
- Excess of tea and coffee, or their intake with food.
- Tobacco and tobacco products.
- Excess of spices and salt

RESEARCH CHALLENGES

- For new diagnostics - Quick and reliable method for diagnosis. New diagnostic are also highly needed for rapid assessment of MDR-TB.
- For new drugs - A much shorter treatment is needed, that is safe and non toxic, compatible with antiretroviral drugs and efficient against the resistant forms of the disease.
- For new vaccines - To revolutionize TB control, we need a vaccine that not only protects against new infections but stops the 35% of the world's population that is already infected with the TB germ from developing TB disease.

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