

INTERNSHIP REPORT:-

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**TOPIC:- IMPACT OF EARLY DIAGNOSIS AND
MONITORING ON TUBERCULOSIS PROGRESSION**

INTRODUCTION:-

Tuberculosis (TB) is a highly infectious disease caused by the acid fast pathogen *Mycobacterium tuberculosis* (Mtb) and predominantly infect the lungs and was discovered in 1882 by Robert Koch. But it also attacks other important organs of the body causing extra-pulmonary TB. Mtb transmission occurs commonly via air droplets (produced by coughing, sneezing, etc.), as tuberculosis is a communicable disease. According to global tuberculosis facts given by WHO 2022, Millions of people are getting ill from this disease each year that is nearly around 10.6 million and almost 1.6 million people of the world die from TB (including HIV-positive). The number of people newly diagnosed with TB went down from 7.1 million in 2019 to 5.8 million in 2020. We therefore need advanced TB diagnostic methods like this that are leader and more likely and cause no barrier for other pandemics in the future [1].

TB patients were predominantly adults (> 90%), more cases appeared in men than in females [2]. Worldwide, one in four individuals show an immune response to Mtb infection and they can either remain latent or advance into active disease. It used to be called latent TB.

Tuberculosis can affect either the lungs, which is called pulmonary tuberculosis (PTB), or other organs, known as extra pulmonary tuberculosis (EPTB) [3].

Tuberculosis (TB) is a major worldwide killer with an annual death toll of at least 1.2 million people. Preventing infection and mortality among invisible patients whom the existing detection methods have not been successful to detect [4]. The immune response against TB is a continuous process; the prediction of those who are transitioning from “latent tuberculosis infection (LTBI)” to active TB disease is almost as critical in the diagnosis of ultra-short treatment duration among those needed preventive therapy [5].

METHODOLOGY:

RESEARCH GAP:-

- 1.) This study is conducted to know the impact of early diagnosis and monitoring on tuberculosis progression.
- 2.) The study is conducted to know different diagnosis methods for detecting tuberculosis.
- 3.) The study is conducted to know the new methods used for diagnosis of tuberculosis infection.

4.) What are the limitations of conventional methods of diagnosis for detecting tuberculosis.

RESEARCH QUESTION:-

1.) What is the impact of early diagnosis and monitoring of tuberculosis progression?

2.) What are the conventional methods used in the diagnosis of tuberculosis and what are the limitations of using conventional methods?

3.) What are the advanced and nano-diagnostic methods used in the diagnosis of tuberculosis?

4.) What is the importance of monitoring tuberculosis?

5.) What are the different stages of tuberculosis infection and its progression from latent TB to active TB?

RESEARCH OBJECTIVE:-

1.) The objective is to study the impact of early diagnosis and monitoring of tuberculosis progression.

2.) To study different conventional methods used for diagnosing tuberculosis and what are the limitations of these methods.

3.) To study the advanced and nano diagnostic methods used in the diagnosis of tuberculosis.

4.) To study the importance of monitoring tuberculosis.

5.) To study different stages of tuberculosis and its progression from latent TB to active TB.

RESEARCH TYPE:-

The sort of analysis used for this project comprises of an initial exploratory research followed by a descriptive study. This exploratory study assesses the present methods for diagnosing and monitoring tuberculosis (TB), highlights the limitations of conventional methods, and looks into the potential of new tools. This helps provide a comprehensive understanding of the problem and its solutions. For the descriptive study, information is collected and analysed regarding the actual impacts of early diagnosis and monitoring on tuberculosis outcomes, such as treatment success, disease spread, and financial burden. Combining exploratory and descriptive studies provides a solid foundation for well-informed recommendations.

CHAPTER 6: CONCLUSION

With the help of this review we concluded that it is significant to have proper diagnosis and monitoring of tuberculosis infection which will help to reduce the spread of infection that can be contagious. If tuberculosis is diagnosed and treated quickly, so the chances of patient survival and recovery increases and it also reduces complication. The conventional methods used for the diagnosis are chest radiography, sputum smear microscopy etc. are used earlier for the diagnosis but recently used methods are CRISPR/cas12a, micro RNA, gold nanoparticle etc. which enhances the chances of detecting tuberculosis infection in a limited time as compared to conventional methods.

We also studied the impact of early diagnosis and monitoring which will help in reducing disease transmission, improve treatment outcome, prevention form drug resistance.

The recommendations of the review is that, we can provide personalized treatment to the patients which will help in advancing the treatment for the patient. Personalised treatment will make sure that the patient receives specific medication which will have a bigger impact on patient's health and the recovery will be faster resulting in very low recurrence of the disease.