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INCIDENCE OF PULMONARY MYCOBACTERIUM TUBERCULOSIS AND ITS EVALUATION AND DIAGNOSIS OF AFB IN PARUL SEVASHRAM, HOSPITAL

Author's Name: [1]Jeemali, [2]Dhruvi Patel

Affiliation: [1]Parul University, Vadodara, Gujarat, India

[2]Assistant Professor, Parul University, Vadodara, Gujarat, India

E-Mail ID: pateldhruvimayankbhai@gmail.com

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Abstract

Tuberculosis, long known to be a major cause of morbidity and mortality throughout the world has for the past several decades been overlooked a disease in both industrialized and developing countries. The aim of the study is pulmonary mycobacterium tuberculosis *disease to evaluate symptoms and diagnose in patients with AFB positive sputum smear. We have collected retrospective data from respiratory department of Parul sevashram hospital, Vadodara. Total 295 data was collected from Jan-march 2022. The symptoms, duration of illness, previous consultation and investigations were recorded. The evaluation of Positive tuberculosis done on the basis of AFB microscopy of sputum and Chest X –Ray. All collected data were analysed by Microsoft Excel. In the 3 months period, total of 295 cases of pulmonary tuberculosis were suspected. In the same period,* ***23(8%) patients were found positive*** *and* ***272(92%) patients were found negative.*** *According to age, distribution of prevalence positive and negative patients is described. All age group were affected but* ***high point of suspected incidence was in age group 51-75 years.*** *107 patients out of 295 patients suspected. Most patients are suspected between age range of 51-75 years in 3 months of data. Common tuberculosis symptoms we found is cough and fever. 16 patients were found positive between age bunch of 25-50 years.* ***No data is obtained of re-infected patients in 3 months.*** *As compare to positive patients, negative patients are highly found.*

Keywords*: Pulmonary, Incidence, tuberculosis*

INTRODUCTION

Tuberculosis is known for very long time and it is death-dealing infection in our human life, still leads to health, social and financial Burden in world wide. The concern regarding more TB deaths leads to developing a keen interest among health authorities and government from the past 20 years. Tuberculosis is one of the primary and most considered irresistible infection, according to R.Koch research which was done 100 years ago, but many questions are still unanswered on the mechanism of pathogenesis and on the immunological correlates. (1)

Mycobacterium tuberculosis, the etiologic agent of Tuberculosis in human. *Mycobacterium tuberculosis* disease happens when particles of tubercle bacilli fused in the air from the infected patient with active pulmonary TB reach the alveoli of the host. (2)

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PATHOGENESIS OF TUBERCULOSIS:

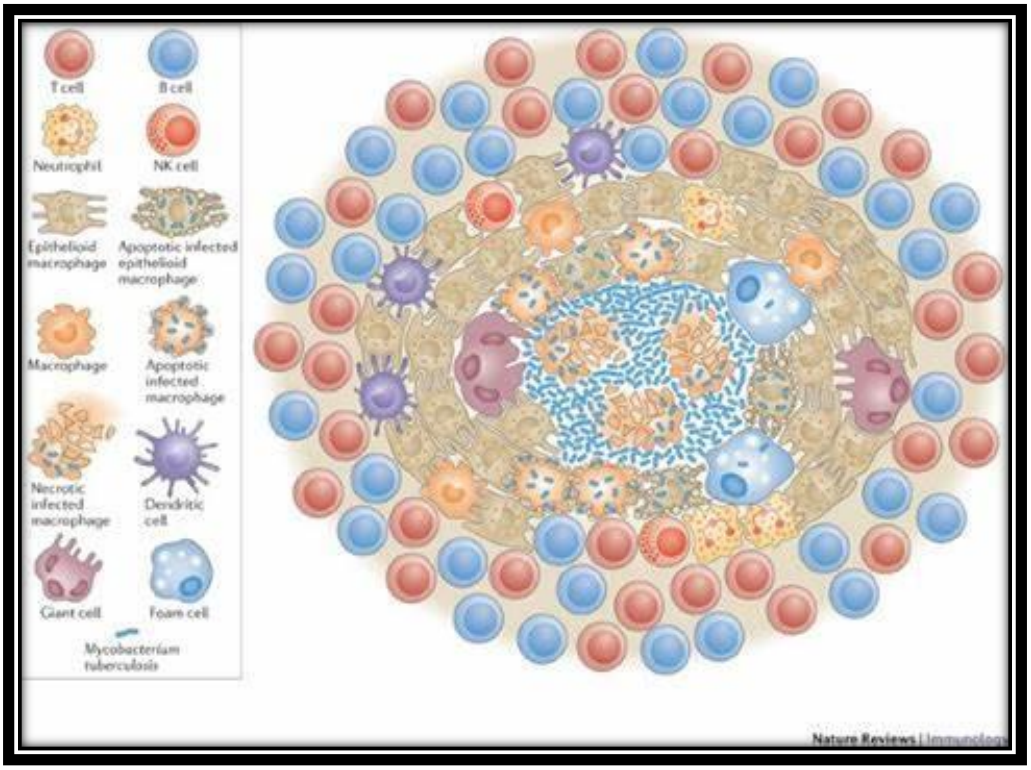

Figure 1: Pathogenesis of Tuberculosis

The bacteria of tuberculosis are known as tubercle bacilli in their active state. while they are present in air, they can spread among human beings through air. It resides inside the respiratory system and when the person's immunity is unable to be immune against the bacteria it starts replicating inside the alveolar and starts their pathogenesis. The circulatory system and lymphatics provide a way to tubercle bacilli to transmit other organs and tissue. When cell-mediated safe reaction breaks in, bacterial replication is normally done and, in 90-95% patients have non plain side effects of illness result (Inactive TB). During latent infection a dynamic equilibrium between the bacilli and host immune responses is established and any event that weakens cell mediated immunity may lead to active bacterial replication, tissue damage and disease (active TB). [1]

There are many diagnostic tests are used to detect mycobacterium tuberculosis like AFB microscopy, CBNAAT, Chest X-ray, culture. According to Jorge Luis Diaz-Huerta et.al's study, the main characteristics of the mycobacterium tuberculosis is being an Acid-fast bacillus. [3] To analyse tuberculosis, the WHO suggest Acid-Fast bacilli microscopy for testing to sputum sample given from suspected patients who approaches to visit hospital. [4] AFB microscopy identifies those cases that are study of disease transmission most critical, I.e., those that are mostly likely to transmit to their close contact. [3]

As the study of S.k.singh et.al, the overall prevalence of tuberculosis in India was 0.32%. The prevalence of TB highly found in males (0.4%) than female (0.2%). Patients who are living in low-maintenance region have a peak level of TB (0.34%) than who are living in high maintenance region. As a matter of fact, people coming from the most deprived had top-level incidence of TB (0.53%). [8] phenomenon of drug resistance in Mycobacterium tuberculosis was observed as early as 50 yr. ago,

the current threat is due to the emergence of strains resistant to the two most potent anti-TB drugs viz., isoniazid (H) and rifampicin (R) (multidrug resistant-tuberculosis, MDR-TB). [6]
The positive-negative ratio was determined among total patients presenting with respiratory complains, suspected undergoing sputum AFB microscopy, and those suspected found to be positive or negative. The aim of the study was to check the ratio of positive-negative patients.

AIMS AND OBJECTIVE

The aim of this study is pulmonary mycobacterium tuberculosis disease to evaluate and diagnose in patients with AFB sputum smear. To check the ratio of patients that how much patients get cure and how much patients re-infected by pulmonary tuberculosis.

MATERIAL AND METHOLOGY

This study was approved by Parul university institutional ethics committee for human research (PU-IECHR) with approval no **PUIECHR/PIMSR/00/081734/4520**. The retrospective data collected during January to march, 2022. All suspected patients as tuberculosis at the Parul sevashram hospital, Vadodara, Gujarat. The clinical data was collected from RNTCP (Revised national tuberculosis control programme) department. This a screening patient's symptoms 15 days duration of illness, cough, underlying disease, previous consultation and investigation were recorded. In our hospital, all suspected patients of tuberculosis had a chest radiograph and HIV test done. Sputum was sent to microscopy for Acid-fast bacilli Examination. We collect data on clinical characteristics like Age, sex, symptoms (fever, cough, abdominal pain, breathing problem, asthma, chest pain, weight loss, lung infection). Data were collected from patients' medical records, with verification by doctors. Tuberculosis test was performed in our hospital by lab. Technician.
To analyse the data diagnostic method was used AFB microscopy. AFB performed by collecting 3 consequently days by sputum sample. During microscopy RNTCP guideline was followed. An interpretation was recorded one the basic of Acid-fast bacilli's appearance.

RESULT

In this retrospective study, 3 months (Jan 2022- March 2022) data was collected from Parul sevashram hospital, Vadodara, Gujrat. Total 295 clinical data was collected. Where 98 (33%) patients are female and 199 (67%) patients are male. As per clinical data smear-positive and smear-negative patients were 23 (8%) and 272 (92%). Out of these, 7 (30%) pf smear positive were female and 16 (70%) were males. Age according distribution shows in graph 1 & 2.

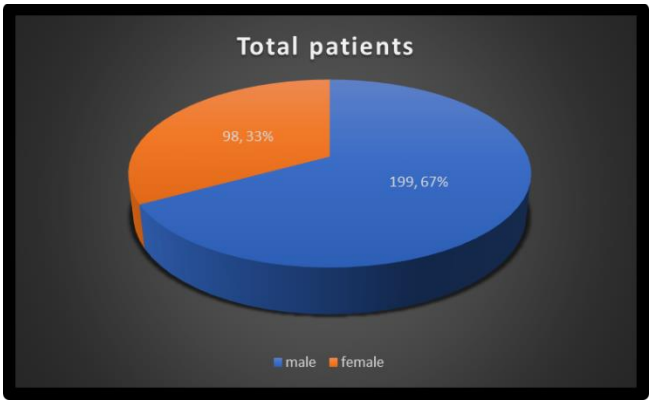

Chart 1: Total suspected patients

This pie chart shows total suspected patients of tuberculosis. There are 33% females and 67% males found suspected of mycobacterium tuberculosis.

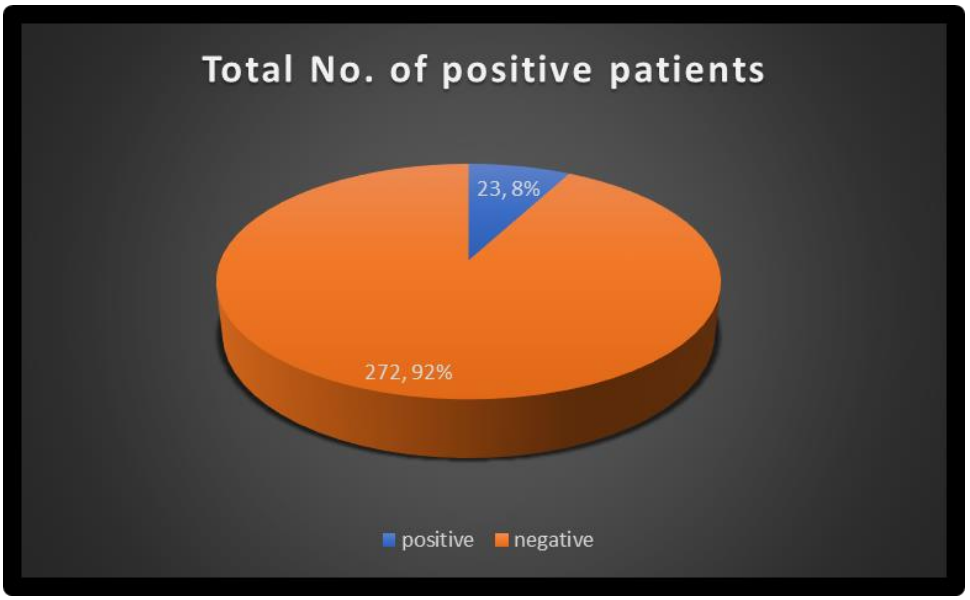

Chart 2: Total no. Of positive patients

This figure gives information about total no of positive patients found in 3 months of data. There are 23(8%) patients are positive and 272(92%) patients are negative. Total ratio of positive-negative ration is **2:23.**

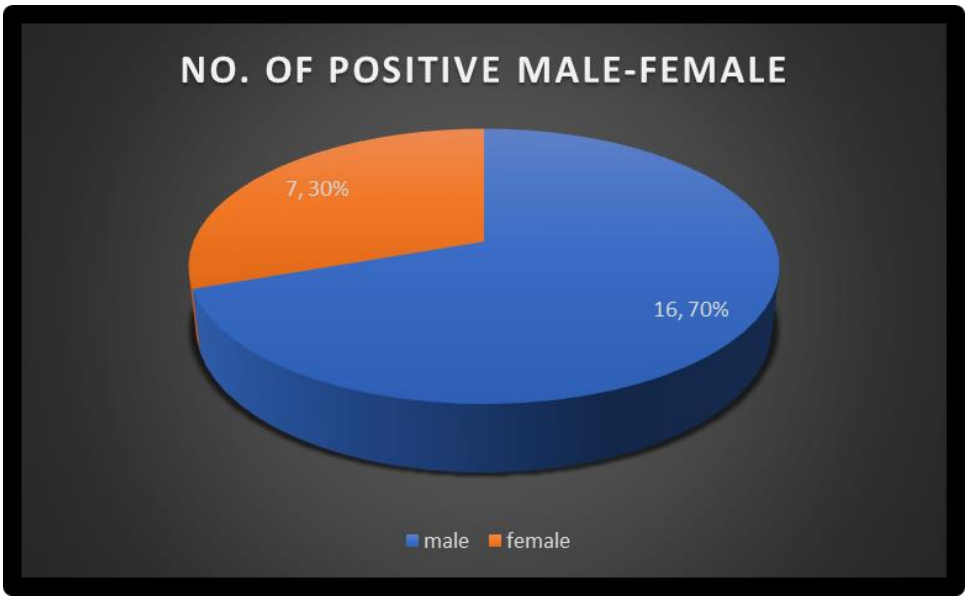

Chart 3: No of positive male-female

This image information about positive patients found in male-female. Out of these,7 (30%) was of females and 16 (70%) of males. The ratio of positive male-female is **7:3.**

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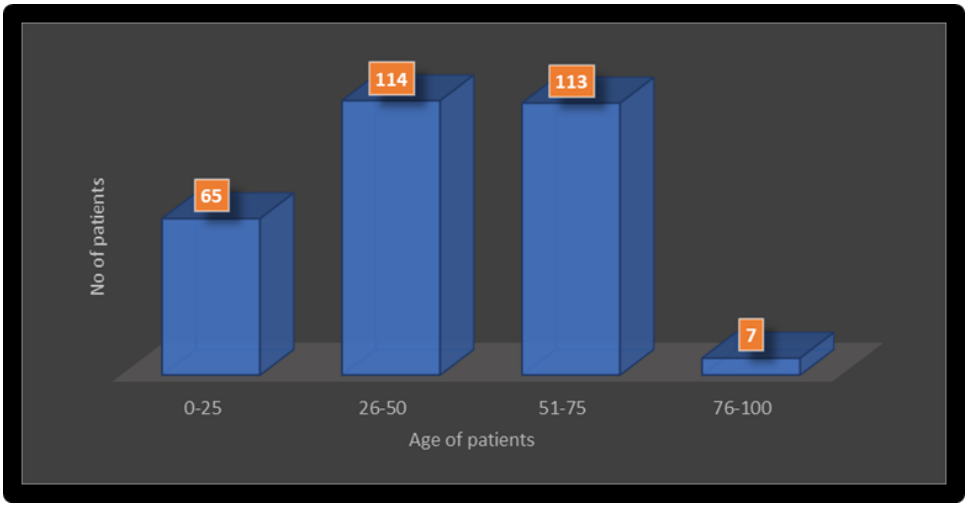
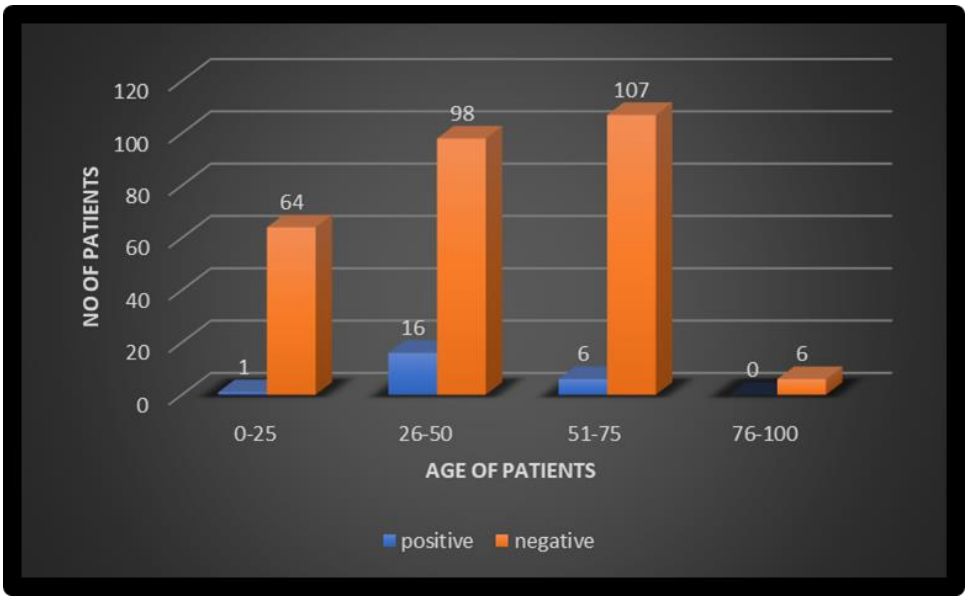


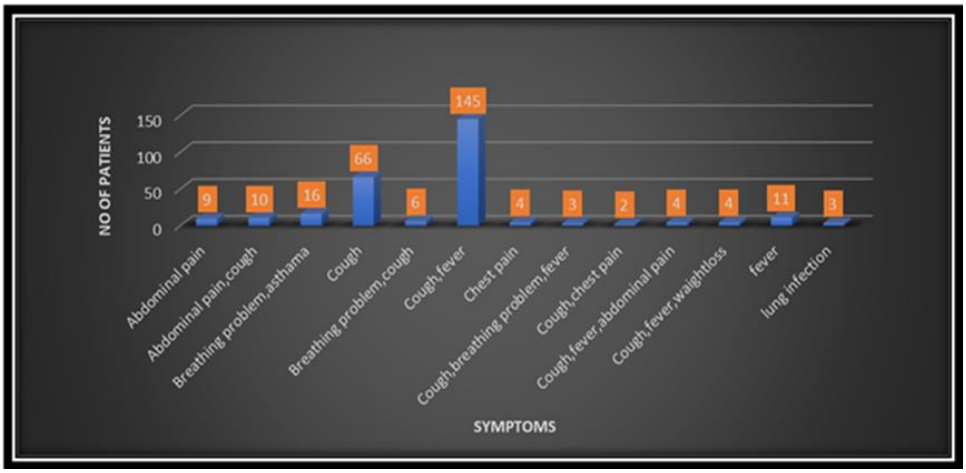
Graph 1: No of patients according to age

As per graph there is age bunch (0-25,26-50,51-75,76-100). There are 65 patients in the age gather of 0-25 year. In age group of 26-50 year there are 114 patients. 113 patients are found in age group of 51-75 and there are 7 patients found in age range of 76-100 years.



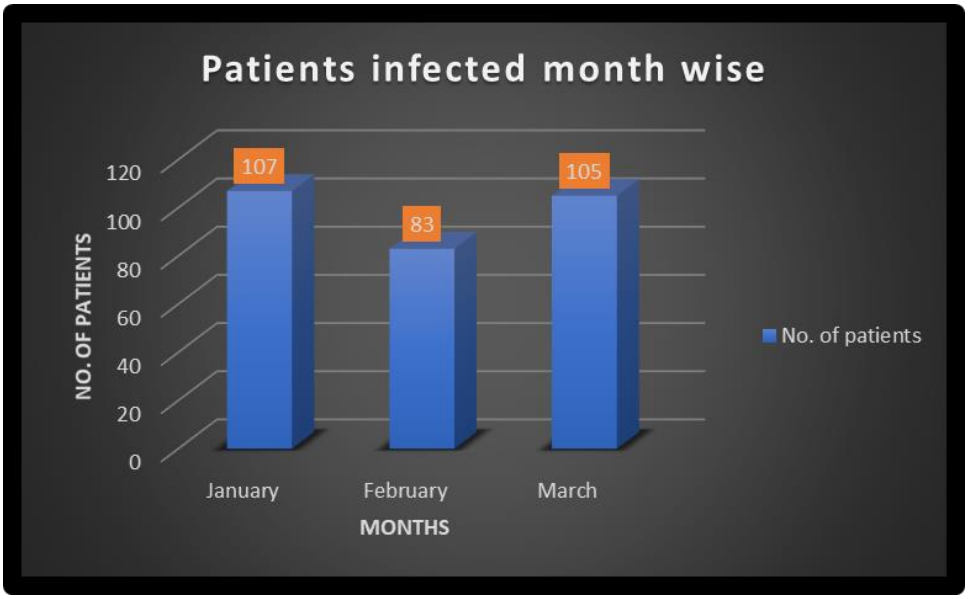
Graph 2: Age wise positive-negative patients

As per AFB test, there is 1 patient found positive and 64 patients found negative in age bracket of 0-25 years, 16 patients are found positive and 98 patients found negative in age range of 26-50 years, 6 patients are found positive and 107 patients found negative in age group of 51-75 years and 6 patients found negative and none patients were found between age range of 76-100 years.



Graph 3: No. Of patients according to symptoms

This image gives information about No of patients according to symptoms. There are 9 patients of abdominal pain and 10 patients of abdominal pain and cough. There is total 16 patients have symptoms of breathing problem and asthama.66 patients of having problem of cough,6 patients have breathing problem and cough together. 145 patients who are having high incidence symptoms of cough and fever. There are 4 patients of chest pain, 3 patients are having problem with cough, breathing problem, fever. As per graph 2 patients having problem with cough, chest pain and 4 patients having problem with cough, fever, abdominal pain. There is total 4 patients who are having problem with cough, fever and weight loss and 11 patients of fever. There are 3 paints having trouble with lung infection.



Graph 4: Month wise infected No. Of patients

This graph shows us clinical data of how much patients suspected month wise. High level of patient's gets infected in January (107) and low data founds in February (83). In march, there are 105 patients suspected by tuberculosis.

DISCUSSION

According to another study done at Mangalore Karnataka; they have collected data from in-out patients diagnosed as tuberculosis. positive- negative patients of tuberculosis were 82% and 18% out of 446 patients, respectively. [7] However, in my study, positive-negative patients of tuberculosis were 8% and 92%. The result of this analysis shows that the positive and negative ratio in patients of mycobacterium tuberculosis is **2:23**.

Another study done in Kedah medical centre; the high prevalence was in 61-70 age bunch. Overall, there was a majority of male patients (male: female= 60:40). [5] However, in my study Age-wise distribution of patients also shows some interesting details. Age-bunch of 51-75 years gives high level of suspected patients numbers but, age bunch of 26-50 years give information highest positive patient's incidence. remarkable observation is that, the positive male: female ratio is **7:3**.
A further study of pulmonary tuberculosis done in Karnataka's patients' shows that, (a) positive ratio in male- female is 2:1**.** (b) Ratio of suspected positive: negative was 4.4:1. [7] However, in conclusion of my study of mycobacterium tuberculosis patients study shows that (a) positive ration in male-female is 7:3. (b) Ratio of suspected positive: negative was 2:23 (8% patients are positive and 92% patients are negative).

CONCLUSION

According to this research, mostly patients were infected in the month of January I.e., 107 patients out of 295 patients. Most patients are found between age range of 51-75 years in 3 months of data and the common tuberculosis symptoms we found is cough and fever. No data is obtained of reinfected patients in 3 months. **As compare to positive patients, negative patients are highly found in last 3 months.**
This study can rise in incidence, receive medical treatment of negative-positive patients, or good standard of sputum sample collection and study is hard to explain due to few amounts of data and retrospective nature of the study. tuberculosis identification or cure and where further research might be needed to identify appropriate interventions to reduce the cases of tuberculosis in world. This study will help to conclude tuberculosis in the world.

ACRONYMS

AFB- Acid-Fast Bacillus
TB- Tuberculosis
MDR- Medical device reporting
RNTCP- Revised National TB control Programme
HIV- Human immunodeficiency virus

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