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A Comparative Study: Comparison of Two Different Fluorescent Stains - Auramine and Rhodamine- with Ehrlich-Ziehl-Neelsen, Kinyoun Staining, and Culture in the Determination of Acid Resistant Bacilli

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Abstract : Objective: In many countries, tuberculosis (TB) is still one of the most important diseases. Tuberculosis is among top 10 causes of death worldwide. The early diagnosis of active tuberculosis still depends on the presence of acid resistant bacilli (ARB) in stained smears. In this study, we aimed to investigate the diagnostic performances of Erlich Ziehl Neelsen (EZN), Kinyoun and two different fluorescent stains. Methods: The specimens were obtained from the patients who applied to Chest Diseases Departments of Ankara Atatürk Chest Diseases and Thoracic Surgery Training and Research Hospital, and Afyon Kocatepe University, ANS Research and Practice Hospital. The study was carried out in the Medical Microbiology Laboratory, School of Medicine, Afyon Kocatepe University. All the non-sterile specimens were homogenized and decontaminated according to the EUCAST instructions. Samples were inoculated onto the Löwenstein-Jensen agars (bio-Merieux Marcy l'Etoile, France) and then incubated at 37˚C, for 40 days. Four smears were prepared from each specimen. Slides were stained with commercial EZN (BD, Sparks, USA), Kinyoun (SALUBRIS Istanbul, Turkey), Auramine (SALUBRIS Istanbul, Turkey) and Rhodamine (SALUBRIS Istanbul, Turkey) kit. While EZN and Kinyoun stainings were examined by light microscope, Auramine and Rhodamine slides were examined by fluorescence microscopy. Results: A total of 158 respiratory system samples (sputum, broncho alveolar lavage fluid…etc) were enrolled into the study. A hundred and two of the samples that processed were found as culture positive. The sensitivity, specificity, positive predictive, and negative predictive values were detected as 100%, 67.5%, 73.5%, and 100% for EZN, 100%, 70.9%, 77.4%, and 100% for Kinyoun, 100%,77.8%, 84.3%, 100% for Auramine, and 100%, 80% , 86.3%, and 100% for Rhodamine respectively. Conclusions: According to our study auramine and rhodamine staining methods showed the best diagnostic performance among the four investigated staining methods. In conclusion, the fluorochrome staining method may be accepted as the most reliable, rapid and useful method for diagnosis of the mycobacterial infections truly.

Keywords : acid resistant bacilli (ARB), auramine, Ehrlich-Ziehl-Neelsen (EZN), Kinyoun, Rhodamine
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