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# Comparative study between using lowenstein jensen and bio-fm medial in identification of mycobacterium tuberculosis

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Tuberculosis (T.B.) still represents a monumental problem in the world, with almost 9.4 (range 8.9-9.9 million) million new cases in 2008 (139 per 100 000 population) compared with 9.27 million new cases (139 per 100 000 population) in 2007 and 9.24 million new cases (140 per 100 000 population) in 2006. Although smear microscopy shows the highest rates of disease detection yearly world wide, culture systems give more accurate results for isolation of MTB as they are more sensitive than smear microscopy. Lowenstein Jensen culture is the most widely used especially in low-income countries, On the other hand, Bio-FM is an enriched Middlebrook 7H9 medium, optimized for rapid MTB growth. This work aimed to evaluate the detection rate and time of MTB by using Bio FM system in comparison with the Lowenstein-Jensen medium. This study included 50 sputum smear positive tuberculous patients, who were classified into 34 new cases (group I) representing 68% of the total cases, 10 relapsed cases (group II) and 6 treatment failure cases (group III) representing 20% and 12% of the total cases respectively. The following were done to all cases: 1- Thorough history taking 2- Complete physical examination 3- Routine laboratory tests including ESR 4- Plain chest X-ray P.A and lateral view when needed 5- Sputum smear for acid fast bacilli (Zeil Neelsen staining) 6- Tuberculin skin test using Mantoux technique 7- Sputum culturing on Lowenstein-Jensen medium 8- Sputum culturing on Bio -FM medium 9- The results were tabulated and statistically analyzed. Summary 90 The mean age in group I was 39.47 years  $\pm$  15.122 and in group II 41.60 years  $\pm$  11.983 while in group III it was 37.50 years  $\pm$  12.518. It was noticed that all groups were age matched and there were no statistical differences between them. In group I: male patients were 26 (76.47%) and female were 8 (23.53%), while in group II: male patients were 8 (80%) and female were 2 (20 %). In group III: 5 male (83.33%) and only one female (16.67%) were in this group. It was noticed that all groups were sex matched and there were no statistical differences between them. These result showed that the highest value of mean ESR was (68.97 mm/hour  $\pm$  24.677) concerned with group I in which 31 patients gave positive reactions (91.18%), compared with the lowest value which was (29.20 mm/hour  $\pm$  22.295) concerned with group II, with 8 patients gave positive reactions in this group. In group III, 5 patients gave positive reactions and the mean value was (36.50 mm/hour  $\pm$  31.227). Tuberculin test gave significant induration only in 44 cases (88%) of total 50 cases, 31 in group I (91.18%), 8 in

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group II (80%) and 5 in group III(83.33%).The highest mean value was for the cases of group I ( $16.13 \text{ mm} \pm 4.717$ )and the lowest was for group III ( $9.80 \text{ mm} \pm 3.563$ ) with group II ( $11\text{mm} \pm 5.043$ )in between, while the total cases record ( $14.46 \text{ mm} \pm 5.298$ ). The highest value for a single case was 24 mm in group I and the lowest was 5 mm for 2 cases in group II.14 patients with minimal lesion on chest X- ray gave positive results on Lowenstein Jensen compared with only 13 on Bio-FM. 21 patients with moderate advanced gave positive results on Lowenstein Jensen compared with only 20 on Bio-FM. 12 patients with far advanced lesion gave positive results on both media.The mean detection time on Bio-FM was significantly shorter than that on Lowenstein Jensen in cases of moderately advanced tuberculous lesions on (0.05).In this study, we compare between both chest X-ray (P-value as regard duration range. No cases gave positive results on Lowenstein Jensen with duration up to 7 days compared with 14 cases gave positive results on Bio-FM representing 30.43% of the total number of cases. On the other hand, with duration range 8-14 days, 15 cases gave positive results on Lowenstein Jensen representing 31.91% of the total number of cases compared with 20 cases on Bio-FM representing 43.48% of the total cases. The total number of cases that gave positive results on Bio-FM with duration range up to 14 days was 34 cases representing 73.91% compared with 15 cases on Lowenstein Jensen representing only 31.91% of the total number of cases. With duration range 14-21 days, 19 cases gave positive results on Lowenstein Jensen representing 40.43% % of the total number of cases compared with 7 cases on Bio-FM representing 15.23% of the total number of cases. With duration range beyond 14 days up to 56 days, only 5 cases gave positive results on Bio-FM representing 10.86% % of the total number of cases compared with 13 cases Lowenstein Jensen on representing 27.65% of the total number of cases. It is noted that no cases gave positive results on Bio-FM after 49 days. All cases of group I gave positive results on Lowenstein Jensen -(100%) compared with only 33 cases of this group gave positive results on Bio FM(97.1%). Only 8 cases in group II gave positive results on both media (80%) and 5 cases in group III (83.33%).The main purpose of this study is to compare between Lowenstein Jensen and Bio-FM as regard detection time and rates. No significant difference between the two media in diagnostic yield (94% of the total cases give positive results on Lowenstein Jensen compared with 92% on Bio-FM), but the detection time of cases on Bio-FM was highly significant shorter than that of cases on Lowenstein Jensen (P-value