Comparison of Two Different Strengths of Carbol Fuchsin in Ziehl-Neelsen Staining for Detecting Acid-Fast Bacilli

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Selvakumar et al. (5) compared smear staining of acid-fast bacilli (AFB) by two different strengths of carbol fuchsin in Ziehl-Neelsen staining. First we would like to applaud the authors for providing a study on an important test method, the Ziehl-Neelsen AFB staining procedure, which receives little attention relative to its critical importance in worldwide tuberculosis control. We are also asking why the concentration of basic fuchsin was changed from about 1%, as published in the original study by Neelsen (4) to 0.3% (1) (we could trace back to this article only). We presume that there were earlier comparative studies for which we can find no reference. The use of 0.3% carbol fuchsin is documented as far back as 1948 and has been published in early Centers for Disease Control and Prevention (CDC) (6) manuals in addition to the International Union against Tuberculosis and Lung Disease (IUATLD) (3) and World Health Organization (WHO) (7) manuals. A concern, however, is the method the authors used to derive the study concentration of 0.3% carbol fuchsin. In a comparative study it is imperative that laboratories use comparable methods for stain preparation. This study did not follow the standard procedure for making the study concentration of 0.3% carbol fuchsin. The authors did not consider the final concentration of phenol in preparing the concentration of 0.3% carbol fuchsin. The concentration of phenol is 5% according to WHO (7), IUATLD (3), and CDC (6) manuals. The authors diluted the 1% carbol fuchsin with water to make it 0.3% carbol fuchsin, which would also dilute the phenol concentration to ~1.7%. The role of phenol is critical in the staining process (2). The concentration of phenol is 5% in previous (1, 4) studies and in the WHO (7), IUATLD (3), and CDC (6) manuals. This may have contributed to the lower percentage of smear positives. We believe this study should be repeated using the concentration of 0.3% fuchsin and 5% phenol so that a definite conclusion can be reached.

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Ed. Note: The authors of the original article did not respond.