

# **Dedication**

This work is dedicated to my:

Parents

Brothers

Sisters

Sons

Daughter

&

Wife

# Acknowledgment

First of all my prayers and thanks to **Allah**, the lord of worlds, most gracious most merciful.

I am deeply indebted to my great and gentle supervisor **Dr. Mohammed Baha Eldin Saad** for his valuable and appreciated help, support and guidance during this study. Without his help, patience and assistance, this work could not have been established.

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## Abstract

This study was conducted in the medical laboratories in Kosti city. The laboratories comprised the governmental, non-governmental and private sector labs, to evaluate the result of malaria diagnosis by microscopy. 524 samples were taken by different laboratories. From each individual, a duplicate sample was taken for follow up by the investigator. From the blood sample, thick and thin smears were prepared, stained by Giemsa and examined microscopically to compare the results of each laboratory. The smears were examined by the investigator, in addition some of the slides examined by the laboratories under survey were sent to the reference laboratory of malaria administration in kosti for further confirmation of the results. The results were as follows:

- The rate of the false positive results in all laboratories reached 63%.
- The highest false results (79%) were reported by the governmental laboratories, while the non governmental laboratories and private laboratories reported 55 % and 48 % false results respectively.
- The difference was found to be statistically significant.
- Although the collection of the samples was done properly the percentage of the false positives reached 67% and when collection of the samples was done in properly, the percentage reached 63%.
- The study showed that when blood smears were done properly, the false positives rate reached 20%, and when the blood smears were done improperly the rate reached 65%.

- When the smears were properly stained, the false positives rate was 30% and when the smears were improperly stained, the rate was 69%.
- When evaluating the effect of the general condition of the laboratory (building, electricity and water supply, space and cleanliness) on the performance of the result the false positives reached 63% in both good and bad condition laboratories.
- Despite the use of good and efficient microscopes the rate of false positives results reached 67% and 50% when inefficient microscopes were used.
- The study showed that, when a good quality immersion oil, was used the false positives results was 46% and reached 83% when the quality of immersion oil is bad.
- The study showed that the false positive result reached 77% among personnel who did not receive training in malaria and 39% in those who received training in malaria.
- The result revealed that the false positive rate was 29% among those samples examined by university graduates, while it reached 69% among those holding diplomas. The rate reached 74% among the samples examined by mixed graduates.

## النتائج

اجريت هذه الدراسة في مختبرات مدينة كوسٌتني بمحفظة قطاعاتها الحكومية وش به الحكومية والخاصة بهدف تقييم وقياس نتائج التشخيص عند استخدام المجهز الصوائي لفحص عينات الملاريا.

تم اخذ 524 عينة ، لكل عينة شريحتان الاولى يتم اخذها ومعالجتها واستخرج نتيجتها بواسطة المعمل المعنوي والآخر يتم اخذها ومعالجتها بواسطة الباحث حيث انها تحتوي على فيلم سميك والآخر رفيع يتلقى التقييم اولاً بواسطة الباحث للمعمل المعنوي لمراجعة النتائج، وتسجل نتائج المراجعة مع شرائح المعمل المعنوي وترسل للمطابقة والمراجعة مع نفس عينات الباحث للمعمل المرجعي للملاريا بـ كوسٌتني وكانت النتائج كالتالي: معدل الخطأ لكل المعامل في انتشار المرض كان بنسبة 10% في حين سجلت المعامل نسبة 28%.

معدل الخطأ الايجابي لكل المعامل بلغ 63%. وفيه سجلت معمل القطاع الحكومي الخطأ الايجابي الاكبر بلغ 79% بينما سجلت معمل القطاع شبه الحكومي والخاص 55% و 48% على التوالي وهذه نسبة ذات قيمة احصائية هامة.

على الرغم من ان جمع العينات قد تم بطريقة صحيحة الا ان نسبة الخطأ الايجابي بلغت 67% اما عند الجمع بطريقة خاطئة بلغت 63%.

أوضحت الدراسة انه عندما تم فرد العينات بطريقة جيدة كانت نسبة الخطأ الايجابي 20% اما عندما تم فردها بطريقة خاطئة بلغت 65%.

عندما تمت صباغة العينات بطريقة صحيحة بلغت نسبة التشخيص الخاطئ 30% اما عندما تمت الصباغة بطريقة غير صحيحة بلغ التشخيص الخاطئ 69%.

عند قياس مدى تأثير الحالة العامة للمعمل من مبني ووجود مصادر الكهرباء والمياه التي النظافة ومساحة المعمل وعلاقتهما بالتشخيص، وجد ان نسبة الخطأ الايجابي بلغ 63% في حالة المعامل ذات الحالة الجيدة وغير الجيدة اي ان حالة المعمل العامة لم يكن لها تأثير على النتائج .

أوضحت الدراسة انه وعلى الرغم من استخدام مجاھر ذات الكفاءة الجيدة الا ان نسبة التشخيص في الخطأ الايجابي بلغ 67%. بينما بلغت 50% عند استخدام المجاھر اقل كفاءةً.

عندما تم استخدام زيت العدسة ذي الموصفات الجيدة بلغت نسبة الخطأ الايجابي 46% بينما ارتفعت هذه النسبة إلى 83% عند استخدام زيت العدسة ذي الموصفات الغير جيدة وهي قيمة إحصائية عالية

أوضحت الدراسة عندما تم تشخيص العينات بواسطة الإفراد الذين تلقوا تدريباً في فحص الملا ريا بلغت نسبة الخطأ الايجابي لديهم 39% بينما سجل الإفراد الذين لم يتلقوا تدريباً 77% في فحص الملا ريا نسبة خطأ ايجابي بلغ

أوضحت الدراسة أن نسبة الخطأ الايجابي بلغ 29% في المعامل التي تم التشخيص فيها بواسطة حاملي الشهادات الجامعية بينما بلغت النسبة 69% لحاملي شهادات الدبلوم أما المعامل التي تجمع الذوقيين وغيرهما من المساعدين وفاحصي الملا ريا بلغت النسبة الأعلى.

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