Sudan University of Science and Technology

College of Graduate Studies

Evaluation of Malaria Diagnosis in Dongola in NorthernState Sudan

تقويم تشخيص الملاريا في معامل مدينة دنقلا في الولاية الشمالية - السودان

A Dissertation Submitted in Partial Fulfillment for Master Degree in Parasitology and Medical Entomology

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2016

بسم الله الرحمن الرحيمٌ

"وأنزل الله عليك الكتاب والحكمة وعلمك ما لم تكن تعلم"

صدق الله العظيم

(سورةالنساء 113)

Dedication

To

The candles which burn to light our life and themercifulsouls which I pray for them to prolong their ages……my parents

To

My happiness source… brothers, husband, my son salah, my sister

To

My respectful supervisor Prof. Mohamed BahaEldin, who helped me to achieving this studyand to all our respectful doctors and teachers in SUST- lab department.

To

My friends, who gave me a favor and supported me,

To

Anyone whoever stretch his hand for help

To

All these I dedicated my study.

Acknowledgement

Great thanks for **my God Allah** for his immortal grace, and for his endless blessing.

Also deeply thanks to my supervisor**Dr. MahamedBahaEldin**for his helps in supervisionand to all our respectful **doctors and teachers** in SUST- **Parasitology and Medical Entomology** for their great efforts during study period.

A lot of thanks to **all staff**in hospitals and clinics where I collect samples for their assistance and thanks sends to all study **participants**.

Special thanks to ustaz Ahmed bakheet to great effort.

Finally, thanks to everyone who help us in this research.

Abstract

This study was conducted in the medical laboratories in Dongola city. The laboratories comprised the governmental, nongovernmental and private sector labs, to evaluate the result of malaria diagnosis by microscopy. 500 samples were taken by different laboratories. From each individual, a duplicate was taken for follow up by investigator. From 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 slide examined by the laboratories under survey were send to the reference laboratory of malaria administration in Dongola for further confirmation of the result. The result were as follows:

The rate of false positive in all laboratories reached 63%.

The highest false positive results 62%were reported by the private laboratories, while the non-governmental laboratories and governmental laboratories reported 60% and 47%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 42%and when collection of the samples was done improperly, the percentage reached 43%.

The study showed that when blood smears were done properly, the false positive rate reached 39%, and when the blood smears were done improperly, the rate reached 46%.

When the smears were properly stained, the rate was 27% and when smears were improperly stained the rate was 66%.

When the general conditions of the laboratory (building, electricity and water supply, space and cleanness) were good the false positives reached 41% and when the general conditions were bad, the rate reached 43%.

Despite the use of good and efficient microscopes, the rate of false positives results reached 34% and 21% when inefficient microscopes were used.

The study showed that, when a good quality immersion oil, was used the false positives results was 36% and reached 60% when the quality of immersion oil is bad.

The study showed that the false positive results reached 51% among personnel who did not receive training in malaria and 30% in those who received training in malaria.

The result revealed that the false positive rate was 26% among those samples examined by university graduates, while it reached 58% among those holding diplomas. The rate reached 47% among the samples examined by mixed graduates.

ملخص الدراسة

أجريت هذه الدراسة في معامل المختبرات الطبية في مدينة دنقلا. وتضمنت المعامل الحكومية وغير الحكومية والقطاع الخاص، لتقييم نتائج تشخيص الملاريا عن طريق الفحص المجهري. تم أخذ 500 عينة من قبل معامل مختلفة. من كل فرد، تم اتخاذ نسخة مكررة للمتابعة من قبل المجهر. من عينة الدم، تم إعداد مسحات سميكة ورقيقة، تم صبغهابالجيمسا وفحصت بالمجهر لمقارنة نتائج كل معمل. بالإضافة إلى بعض الشرائح التي فحصتها المعامل تم إرسالها إلى المعمل المرجعي لإدارة الملاريا في دنقلا لمزيد من التأكيد على النتيجة. وكانت النتيجة كما يلي:

بلغ معدل الإيجابية الخاطئة في جميع المعامل 63٪.وبلغت المعامل الخاصة على أعلى النتائج الإيجابية الخاطئة بنسبة 62٪، في حين بلغت المعامل غير الحكومية والمعامل الحكومية على نتائج خاطئة بنسبة 60٪ و 47٪ على التوالي. وقد تبين أن الفرق ذو دلالة إحصائية. على الرغم من أن جمع العينات قد تم بشكل صحيح، بلغت نسبة الايجابيات الخاطئة 42٪ وعندما تم جمع العينات بشكل غير صحيح، وصلت النسبة إلى 43٪.وأظهرت الدراسة أنه عندما تم إجراء مسحات الدم بشكل صحيح، وصلت نسبة إيجابية خاطئة 39٪، وعندما تم إجراء مسحات الدم بشكل غير صحيح، وصلت النسبة 46٪.عندماتم صبغ المسحات بشكل صحيح، كان المعدل 27٪ وعندما كانت تم صبغ المسحات بشكل غير صحيح كان معدل 66٪.عندما كانت الظروف العامة للمختبر (البناء والكهرباء وامدادات المياه والمساحة والنظافة) جيدة الايجابيات الخاطئة وصلت 41٪ وعندما كانت الظروف العامة سيئة، بلغ المعدل 43٪.على الرغم من استخدام المجاهر جيدة وفعالة، بلغ نسبة نتائج إيجابية خاطئة 34٪ و 21٪ عندما تم استخدام المجاهر غير فعالة. وأظهرت الدراسة أن النتائج الإيجابية الكاذبة بلغت 51٪ بين الأفراد الذين لم يتلقوا تدريبا على الملاريا و 30٪ ممن تلقوا تدريبا على الملاريا.وأظهرت النتائج أن المعدل الإيجابي الكاذب كان 26٪ من بين العينات التي فحصها خريجو الجامعات، في حين بلغ 58٪ من حملة الشهادات. وبلغت النسبة 47٪ بين العينات التي فحصها الخريجون المختلطون.

List of contents

Subject	Page No.
Dedication	I
Acknowledgement	II
Abstract English	III
Abstract Arabic	IV
List of contents	V
List of tables	VI
List of figures	VII
Chapter one :Introduction and literature review	**1**
1.1 Introduction	1
1.2 Classification of malaria	2
1.3 Geographical distribution	**2**
1.4 Transmission of malaria parasite	2
1.5 Life cycle of malaria	4
1.6 Clinical feature and pathology	4
1.7 Uncomplicated malaria	4
Severe malaria 1.8	4

1.9 pathogenesis	6
1.9.1 Anemia	6
1.10 Immunity against malaria	7
1.11 Diagnosis of malaria	7
1.11.1 Direct diagnosis	8
1.11.2 Serodiagnosis	8
1.11.3 Other methods of diagnosis	10
1.12 Misdiagnosis of malaria	12
1.13 Global epidemiology of malaria	12
1.14 Malaria situation in Sudan	13
1.15 Epidemiology of malaria	13
1.15.1 Northern and Nile river states	13
1.151.2 Khartoum state	13
1.15.3 Gezira ,Sinnar and White Nile states	13
1.15.4 Gadarif , Kassala and blue Nile states	13
1.15.5 The western states	13
1.16 Objective	14
1.16.1General objective	14

1.16.2 Specific objectives	14
Chapter two: Material and methods	15
2.1 Study design	15
2.2 Study area	15
2.3 Study population	15
2.4 Sample collection	15
2.5 Data collection	15
2.6 Methodology	16
2.6.1 Preparation of blood films	16
2.6.2 Preparation of Giemsa stain	17
2.6.2.1 Geimsa stain stock solution	17
2.6.3 Preparation of buffered water	17
2.6.4 Staining of blood film for malaria	17
2.6.5 Examination of blood film for malaria	18
2.6.5.1 Examination of thick blood films	18
2.6.5.2 Examination of thin blood films	18
2.7 Data analysis	18
Chapter three: Results	19

Chapter four : Discussion	32
Conclusions	36
Recommendations	37
References	38
Appendix: Questionnaire	39

List of tables

Table		Page
Table 1	The overall prevalence rate of malaria in Dongola	**21**
Table 2	The effect of general condition of the laboratory on the examination result.	**21**
Table 3	The false positive among the examined slides in different types of laboratories.	**22**
Table 4	The false negative among the examined slides in different types of laboratories.	**22**
Table 5	The effect of collection technique on the positivity of the results.	**22**
Table 6	The effect of staining technique on the positivity of the results.	**23**
Table 7	The effect of the efficiency of the microscope on the positivity of the result.	**24**
Table 8	The effect of the quality of the emersion oil on the positivity of the result.	**35**
Table 9	The effect of the smear preparation on the positivity of the results.	**26**
Table 10	The effect of the staff qualification on the positivity of the results.	**26**
Table 11	The effect of the training in malaria diagnosis on the positivity of the results.	**26**

List of Figures

Figure		Page
Figure 1	The overall prevalence rate of malaria in Dongola	**27**
Figure 2	The effect of general condition of the laboratory on the examination result.	**27**
Figure 3	The false positive among the examined slides in different types of laboratories.	**28**
Figure 4	The false negative among the examined slides in different types of laboratories.	**28**
Figure 5	The effect of collection technique on the positivity of the results.	**29**
Figure 6	The effect of staining technique on the positivity of the results.	**29**
Figure 7	The effect of the smear preparation on the positivity of the results.	**30**
Figure 8	The effect of the staff qualification on the positivity of the results.	**30**
Figure 9	The effect of training in malaria diagnosis on the positivity of the results.	**31**