UNIVERSITI PUTRA MALAYSIA

PREVALENCE OF AND FACTORS AFFECTING ACQUISITION OF INTESTINAL CRYPTOSPORIDIOSIS IN MALAYSIAN CHILDREN WITH MALIGNANCIES AT ONCOLOGY WARD, INSTITUTE OF PEDIATRICS, HOSPITAL KUALA LUMPUR, MALAYSIA

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By

LUBNA MOHAMED ELBESHTI

Thesis Submitted to the School of Graduate Students, University Putra Malaysia, in Fulfillment of the Requirements for the Degree of Master of Science

June 2011

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

PREVALENCE OF AND FACTORS AFFECTING ACQUISITION OF INTESTINAL CRYPTOSPORIDIOSIS IN MALAYSIAN CHILDREN WITH MALIGNANCIES AT ONCOLOGY WARD, INSTITUTE OF PAEDIATRICS, HOSPITAL KUALA LUMPUR, MALAYSIA

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Supervisor: Rukman Awang Hamat, PhD

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Cryptosporidium parvum is an opportunistic parasitic agent that has a world-wide distribution. The disease caused by this parasite can be severe and very difficult to manage in immunocompromised patients especially in children with malignancies. However, data on immunocompromised children in Malaysia is very much lacking. The aim of this study was to estimate the prevalence of cryptosporidiosis in children with different types of malignancies and to study factors that might contribute to acquisition of cryptosporidiosis.

A cross-sectional study was conducted over 10 months from November 2009 until August 2010 in Institute of Pediatrics, Hospital Kuala Lumpur. A self-administered questionnaire was used and medical records were obtained. Stool samples were examined for the *Cryptosporidium* oocyst by using two different techniques i.e. modified Ziehl-Neelsen stain and Immunochromatographic (ICT) assays (RIDA-Quick *Cryptosporidium* R-Biopharm, Germany).

One hundred and ten stool samples were collected from children (56 boys, 49 girls) with different types of malignancies between the ages of 3 months and 17 years (mean age: 2 years). The majority of those children were the Malays (75.2%), followed by the Chinese (11.4%), Indians (8.6%) and others (4.8%) The most common type of lympho-hematopoietic malignancies was acute lymphoblastic leukemia (38.1%), followed by acute myeloid leukemia (8.6%), suspected leukemia (8.6%), lymphoma (7.6%), and chronic myeloid leukemia (1.9%). Whereas, among non-lympho-hematopoietic malignancies, brain tumor represented 11.4% of cases, followed by retinoblastoma (5.7%), hepatoblastoma (3.8%), Wilm's tumor (2.9%), pleuropulmonary blastoma (1.9%) and right adrenal cortical tumor (0.9%). Fever was presented in (83.8%) of those patients, followed by diarrhea (54.3%). All stool samples were negative for *Cryptosporidium* oocysts by two different techniques. (33.3%) from those patients had history of admission to other wards, (29.5%) had history of animal contact, (24.8%) had history of swimming in the swimming pool. In terms of precautionary measures practiced, (80.9%) and (75.2%) washed their hands before and after eating, or after going to the toilet respectively. In addition, preventive measures that were also observed: (16.2%) had history of admission to day-care center, (2.9%) had history of drinking tap water, and (0.9%) had history of travel.

In this present study, we documented a zero prevalence rate of cryptosporidiosis amongst children with malignancies despite higher prevalence rates being reported in other developing countries. Our results may suggest that the children with malignancies are at low risk of acquiring cryptosporidiosis because of good personal hygiene, good infection control and practices in the hospital, and improve water supply system. Screening for *Cryptosporidium* oocysts may not be necessary in those patients. Our findings suggest that routine screening of

stools for *Cryptosporidium* might not be necessary for our patients. However, we believe large multicenter studies throughout Malaysia are needed to establish the true prevalence and characteristics of cryptosporidiosis among children with malignancies.

Abstrak projek yang dikemukakan kepada Senat Universiti Putra Malaysia
Sebagai memenuhi keperluan untuk ljazah Master Sains

PREVALENS DAN FAKTOR YANG MEMPENGARUHI KEJADIAN KRIPTOSPORIDIOSIS USU PADA KANAK-KANAK MALAYSIA YANG MENGHIDAPI MALIGNANSI DI WAD ONKOLOGI , INSTITUT PEDIATRIK, HOSPITAL KUALA LUMPUR , MALAYSIA

Oleh

LUBNA MOHAMED ELBESHTI

Jun 2011

Pengerusi: Rukman Awang Hamat, PhD

Fakulti Perubatan dan Sains Kesihatan

Cryptosporidium parvum adalah sejenis agen parasit oportunistik yang mempunyai taburan di serata dunia. Penyakit yang di sebabkan oleh parasit ini boleh menjadi parah dan ia sangat sukar untuk di kawal pada pesakit terimunokompromi terutamanya kanak-kanak malignansi. Namun begitu, data pesakit terimunokompromi di Malaysia tidak mencukupi. Tujuan penyelidikan ini di jalankan adalah untuk menganggarkan prevalen cryptosporidiosis pada kanak-kanak yang mempunyai malignansi berlainan dan mengkaji factor-faktor jangkitan cryptosporidiosis.

Satu kajian keratan rentas telah di jalankan selama 10 bulan dari November 2009 sehingga Ogos 2010 di Institut Pediatrik, Hospital Kuala Lumpur. Soal selidik yang di jalankan sendiri di gunakan dan rekod perubatan di perolehi. Sampel tinja telah di periksa untuk kehadiran oosista

Cryptosporidium menggunakan 2 teknik berlainan iaitu pewarna Ziehl-Neelsen terubahsuai dan asai imunokromatografi (ICT) (RIDA-Quick *Cryptosporidium* R-Biopharm, Germany).

Seratus dan sepuluh sampel tinja telah di kumpul dari kanak-kanak (56 lelaki, 49 perempuan) dengan malignansi yang berlainan, yang berumur di antara 3 bulan dan 17 tahun (min umur: 2 tahun). Sebahagian besar daripada kanak-kanak tersebut adalah Melayu (75.2%), diikuti dengan Cina (11.4%), India (8.6%) dan lain-lain (4.8%). Malignansi berjenis hematopoetik limfa yang paling umum adalah leukemia limfoblastik akut (38.1%), di ikuti dengan leukemia mieloid akut (8.6%), pesakit yang disyaki leukemia (8.6%), limfoma (7.6%), leukemia mieloid kronik (1.9%). Manakala di kalangan malignansi yang bukan berjenis hematopoetik limfa, kes tumor otak mewakili 11.4%, diikuti dengan retinoblastoma (5.7%), hepatoblastoma (3.8%), tumor Wilm (2.9%), blastoma pleuropulmonari (1.9%) dan tumor korteks adrenal kanan (0.9%). Lapan puluh tiga perpuluhan lapan peratus pesakit mengalami demam, diikuti dengan cirit-birit (54.3%). Semua sampel tinja di dapati negatif untuk oosista *Cyrptosporidium* berdasarkan 2 teknik berbeza. Tiga puluh tiga dan tiga peratus daripada pesakit tersebut mempunyai sejarah kemasukan ke wad berlainan, (29.5%) mempunyai sejarah menyentuh binatang, (24.8%) mempunyai sejarah berenang di dalam kolam air. Berdasarkan langkah berjaga-jaga yang di amalkan (80.9%) dan (75.2%) mencuci tangan sebelum dan selepas makan, serta selepas mengunakan tandas. Di samping itu, langkah berjaga-jaga tersebut telah di patuhi: (16.2%) mempunyai sejarah menghadiri pusat asuhan kanak-kanak, (2.9%) mempunyai sejarah minum air paip, dan (0.9%) mempunyai sejarah perjalanan.

Berdasarkan kajian yang telah dijalankan, kami telah mendokumenkan kadar prevalens sifar cryptosporidiosis di kalangan kanak-kanak malignansi walaupun negara membangun lain telah melaporkan kadar prevalen yang tinggi. Keputusan kami mungkin menunjukkan bahawa kanak-kanak malignansi mempunyai risiko yang rendah untuk di jangkiti cryptosporidiosis kerana kebersihan diri yang terjaga, kawalan dan penjagaan infeksi yang baik di hospital serta sumber air yang bertambah baik. Saringan terhadap oosista *Cyptosporidium* mungkin tidak diperlukan bagi pesakit kita. Walau bagaimanapun, kami percaya yang keputusan kami mewajarkan kajian lanjut seperti kajian prospektif longitudinal kawalan kes di masa hadapan. Kajian ini mungkin dapat menolong kami menentukan status imunologi kanak-kanak yang menghidap cancer sama ada mereka lebih cenderung mendapat cyrptosporidiosis.

ACKNOWLEDGEMENTS

By the Name of Allah, Most Gracious, Most Merciful, all praise and thanks are due to Allah, and peace and blessings be upon His Messenger. I would like to express the sincerest appreciation to those who made this work possible: Advisory members, Friends and Family.

I would like to convey my deepest and grateful thanks to my supervisor, Dr. Rukman Awang Hamat for providing me the opportunity to complete my study under his valuable guidance, for the many useful advice and discussions, for his constant encouragement and guidance. I would like to thank all the co-supervisors, Dr. Amal .R. Nimir, Dr. Ngah Zasmy Unyah. I am grateful for their willingness to serve on my supervisory committee, constant encouragement, helpful advice and many fruitful discussions. In addition, I would like to thank Dr. Malina Osman for her help in the statistical analysis of the data.

Special thanks go to the staffs in Oncology Ward, Pediatric Institute, Hospital Kuala Lumpur, who had given me a lot of helping hands during data collection. I would also thank Staffs at Laboratory of Parasitology, UKM, especially Encik Ismail Hj Mohd Ghauth for his assistance for doing the stain technique. Laboratory assistants of mainly Cik Nurhanim Kamaruddin and Encik Mohd Nawawi Daud from Parasitology Laboratory, Faculty of Medicine and Health Sciences, UPM.

I would also like to give all my respect and appreciation for all respondents of this study for their cooperation all along the data collection.

The People's Bureau of the Great Socialist People Libyan Arab Jamahiriya is gratefully acknowledged for providing the financial support. Trust Account no: 6381600. .

Last but not least, very special thanks to my husband, his love, support and encouragements are behind my success.

APPROVAL SHEET

I certify that an Examination Committee has met on (14 June) to conduct the final examination of **Lubna Mohamed Elbeshti** in her thesis entitled " Prevalence of and Factors Affecting Acquisition of Intestinal Cryptosporidiosis in Malaysian Children with Malignancies at Oncology Ward, Institute of Pediatrics, Hospital Kuala Lumpur, Malaysia " in accordance with Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The committee recommends that the student be awarded the degree of Master of Science.

Members of the Thesis Examination Committee were as follows:

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This thesis submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment on the requirement for the degree of Master Sciences. The members of the supervisory committee were as follows:

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DECLARATION

I declare that the thesis is my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institutions.

LUBNA MOHAMED ELBESHTI

Date: 14 June 2011

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