Epidemiological Distribution of Cancer in Sudan in 2007-2008 RICK
التوزيع الوبائي للسرطانات في السودان 2007-2008

A Thesis Submitted for Partial Fulfillment of the Requirement of the
M. Sc. Degree in Radiation Therapy Technology

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Dedication

My soul and inner motivation of moral commitment and sympathy towards cancer patients in Sudan could not help dedicating this research to these patients, particularly those who passed away; to be remembered and those who are still hopefully seeking for a remedy.

Dedication with sincere thanks is also extended to my encouraging family and friends.
Acknowledgement

I would seriously need to offer my great gratitude and appreciation to the Radiation & Isotopes Center Khartoum (RICK) and its supportive staff who provided significant assistance into this reach by making the needed data/info/statistics, and alive cases, available despite their busy and hectic working hours. Thanks and respect to my direct research supervisor Dr. Mohammed Ahmed Omer of faculty of Medical Radiological Sciences and the rest of the teaching staff at the University of Sudan for Science and Technology/Khartoum.
ABSTRACT

The following thesis which is about cancer epidemiology in Sudan has been carried out depending on the information collected from Khartoum Radiation and Isotopes Center, Statistic Section during the year 2007 and 2008.

The statistical plotting and the correlations revealed certain findings which could be highlighted as follows:

During the year 2007, the common cancers in Sudan among males were lymphoma (11.9%), Leukemia (11.6%), and prostate (9.5%) while among females were breast cancer (30.7%) and cervical cancer (10%). And the common cancer type incidences among males during 2008 were Leukemia (11.9%), prostate (10.5%), lymphoma (7.8%) and skin (7.5%), while the common cancer type incidence among Females were breast (30.1%) and cervix (10.8%).

The cancer incidence found to correlated with age increment and fitted to following equation as example: $y = 0.081x + 4.780$. where y refers to the age and x refers to the cancer incidence in percent and the common involved ages.

The cancer incidence ages were as following (2007): In Khartoum state fifty five to sixty years old (10%), sixty to sixty five years old (9.6%). In
Aljazeera state the common involved ages with cancer were of sixty to sixty five years old (10.8%), fifty five to sixty five years old (10.6%) In North Sudan State fifty five to sixty five years old (12.1%), sixty to sixty five years old (11.8%), sixty five to seventy years old (11.1%) with an increasing incidence following aging. In White Nile state the common involved ages with cancer were of fifty to fifty five years old (12.2%), fifty five to sixty years old (10.8%) with an increasing incidence following the ageing In Blue Nile state the common involved ages with cancer were of fifty to fifty five years old (12.2%), fifty five to sixty years old (9.8%), In South Sudan State the common involved ages with cancer were of fifty five to sixty years old (13.4%), forty five to fifty years old (11%), In Darfur State the common involved ages with cancer were fifty five to sixty years old (13.6%), forty to forty five years old (10.1%) and the incidence was in direct proportional with ageing.

In the East state the involved ages were of forty five to fifty years old (14%), sixty to sixty five years old (13.7%) and fifty five to sixty years old (11.1%). In Kordofan state the common involved ages were of sixty five to seventy years old (11%) and fifty five to sixty years old (11%) (and forty five to fifty years old (10.6%)

While in 2008 the cancer incidences versus age were as follows
In Khartoum state the cancer incidences among the age group were predominantly among sixty to sixty five years old (10.6%) and fifty five to sixty years old (10.3%). In Aljazeera state the common involved ages were forty five to fifty years old (11.6%). In North state were of sixty five to seventy (10.9%), forty five to fifty (10.8%), sixty to sixty five years old (10.5%), fifty five to sixty years old (10.2%). In White Nile was among of sixty to sixty five years old (11.8%). In Blue Nile state was among the age group of thirty five to forty years old (10.9%), fifty five to sixty years old (10.5%) and sixty to sixty five years old (10.1%).

In south of Sudan the cancer incidence was predominant among the age group of fifty five to sixty years old (17.6%), forty five to fifty years old (13.5%) and fifty to fifty five years old (10.8%). In Darfur state was among the age group of forty to forty five (12%), fifty to sixty (11%). In the Eastern of Sudan it was commoner among the age group of forty five to fifty years old (14.8%) and forty to forty five years old (10.3%). In Korofan the cancer incidence was commoner among the age group of sixty five to seventy years old (11.4%), fifty five to sixty five years old (10.8%), forty five to fifty years old (10.8%)

The cancer distribution among Sudanese native based on their races (tribes) showed that:

the Predominate cancers among tribes during 2007 are leukemia, breast, cervix, lymphoma prostate, esophagus, Bladder, ovary and nasopharynx
The common cancer incidence among certain tribes in Sudan during 2007 which reveal that the Predominate cancer incidence percent among Algaalya tribes (22.4%), Alshaiyg .(tribes (11.2%) and aldanagla tribes (9.31%)

The common cancer incidence among certain tribes in Sudan during 2008 which reveal that the Predominate cancer incidence percent among Algaalya tribes (22.3%), Alshaiyg .(tribes (9.4%) and aldanagla tribes (8%)

الخلاصة

لقد اعتمد هذا البحث الخاص بنسب ومعدلات الأمراض السرطانية في السودان، إعتماداً كلياً على البيانات والإحصائيات المتوفّرة لدى مركز العلاج بالأشعة والطب النووي بالخرطوم ما بين عامين 2007 و 2008 ميلادية.

كشفت هذه البيانات الإحصائية والعلاقات الترابطية حقائق إمكانيّة لمكن حصرها في الآتي:

-خلال العام 2007 شكل سرطان الغدد الليمفاوية نسبة 11.9% عند فئة الرجال ونسبة 11.6% لسرطان الدم الأبيض، ثم نسبة 9.5% لسرطان البروستات عند نفس الفئة بينما نجد أن فئة النساء قد تميزت بسرطان الثدي حيث بلغت نسبة إصابته في هذا العام 30.6% عليه سرطان عنق الرحم بنسبة 10%.
خلال العام 2008م أظهرت البيانات أن نسب عموم السرطانات في المركز تمثلت عند الرجال بسرطان الدم الأبيض بنسبة 11.9% ثم البروستات بنسبة 10.5% ثم سرطان الغدد اليمَعِاوية بنسبة 7.7% وأخيرا سرطان الجلد بنسبة 6.5% عند نفس الفئة الذكورية. واستعراضاً للفئة النسوية لنفس العام تبين أن عموم الإصابات السرطانية عدهن تمثلت في سرطان الثدي بنسبة 30.1% ثم سرطان عنق الرحم بنسبة 11.8%.

لقد تبين أيضاً الإصابات السرطانية ذات الصلة بالعمر يمكن أخذها كنموذج حيث تم إعتماد المعادلة

\[ y = 0.081x + 4.780 \]

حيث \( y \) يرمز للعمر بينما يرمز \( x \) نسبة الإصابة المؤذة في سنة 2007 نجد في ولاية الخرطوم لقد تم دراسة هذه الإصابات ذات الصلة بعمر المصاب في أواضح الفئة العمرية 55-60 والتي بلغت نسبة 10% بينما إنخفضت النسبة عند الفئة العمرية ما بين 60-65 حيث بلغت 9.6%. كما تم دراسة نفس البيانات الخاصة بالعلاقة العمرية والأصابة بالسرطان في ولاية الجزيرة حيث تبين الاتي:

بلغت نسبة الإصابة 10.8% عند الفئة العمرية ما بين 60-65 ونسبة 10.6% عند الفئة العمرية ما بين 55-65 أما في شمال السودان خلال العام 2007م نجد أن النسب أدنى هي المتوازنة والدالة على عاقبة الإصابات السرطانية بالعمر:

في الفئة العمرية 55-65 بلغت النسبة 12.1%.

في الفئة العمرية 60-65 بلغت النسبة 11.8%.

في الفئة العمرية 65-70 بلغت النسبة 11.1%.

أما في ولاية النيل الأبيض فنسب الإصابة في العام 2007م تباهت ما بين 12.2% للفئة العمرية (50-55).

عام ونسبة 9.8% للفئة العمرية (55-60) عام.

وفي جنوب السودان تباهت النسب أيضاً إذا بلغت 13.4% عند الفئة العمرية (55-60) عام وإنخفضت إلى 11% عند الفئة العمرية (45-50) عام. وفي نفس العام أيضاً، خلفت نسب الإصابة السرطانية حيث بلغت 13.4% للفئة العمرية (50-60) عام ثم نسبة 10.1% للفئة العمرية (40-45) عام.
على النحو التالي:

في الأيبض فكانت الEuro من العمرية 60-65 عام هي الأكثر إصابة بنسبة 11.4% بينما تجاوزت أعداد القبائل في الEuro من العمرية 40-45 عام ونسبة 11% للEuro من العمرية 45-50 عام. أما في جنوب السودان فقد لأن نسبة الإصابة الأكثر شيوعا كانت 17.6%. ذلك أوست الEuro من العمرية 55-60 عام ثم النسبة 10.5% للEuro من العمرية 50-55 عام.

أما في دارفور فقد أن نسبة الإصابة هي 12% للEuro من العمرية 40-45 عام و 11% للEuro من العمرية 50-55. واجتهت نسبة الإصابة في شرق السودان حيث بلغت 14.8% للEuro من العمرية 45-50 ونسبة 10.3% للEuro من العمرية 40-45. كما أن هناك انتشار للإصابة السرطانية في كردفان عام 2008م حيث بلغت النسبة 11.4% في أوست الEuro من العمرية 60-70 ونسبة 10.8% للEuro من العمرية 60-65 و 45-50 على التوالي.

أنواع السرطانات الأكثر شيوعا عند قبائل السودان المختلفة خلال 2007-2008 هي:

الدم الأيض، سرطان الثدي، سرطان عنق الرحم، سرطان العقد الليمفاوية، سرطان البروستات، سرطان البلعوم، سرطان المثانة، سرطان المبيض وسرطان البلعوم الأنفي.

إن أكثر نسب إصابات سرطانية لقبائل السودانية في عام 2007 نجدها لدى قبائل الجعلين 22.4%، الشبابية 11.2% والداقلة 9.31%. أما في عام 2008م بلحظ

كما نجد أيضا في شرق السودان-نفس العام- أن نسبة الإصابة قد بلغت 14% عند الEuro من العمرية (45-50) عام و 13.7% للEuro من العمرية (55-60) عام.

وفي كردفان بلغت نسبة الإصابة 11% للEuro من العمرية (65-70) عام و (55-60) عام على التوالي بينما بلغت

الEuro من العمرية (40-45) عام نسبة 10.3%.

أما حالات الإصابة السرطانية حسن العمر للعام 2008م جنح على النحو التالي:

إن أكثبر نسب الإصابات السرطانية للقبائل السودانية في عام 2007 و 2008 حسب النسبة 22.4% للEuro من العمرية 40-45، 11.1% للEuro من العمرية 45-50، 10.3% للEuro من العمرية 50-55، 10.1% للEuro من العمرية 55-60، و 10.9% للEuro من العمرية 60-65 عام.

أما في دارفور فقد أن نسبة الإصابة هي 12% للEuro من العمرية 40-45 عام و 11% للEuro من العمرية 50-55. واجتهت نسبة الإصابة في شرق السودان حيث بلغت 14.8% للEuro من العمرية 45-50 ونسبة 10.3% للEuro من العمرية 40-45. كما أن هناك انتشار للإصابة السرطانية في كردفان عام 2008م حيث بلغت النسبة 11.4% في أوست الEuro من العمرية 60-70 ونسبة 10.8% للEuro من العمرية 60-65 و 45-50 على التوالي.

أنواع السرطانات الأكثر شيوعا عند قبائل السودان المختلفة خلال 2007-2008 هي:

الدم الأيض، سرطان الثدي، سرطان عنق الرحم، سرطان العقد الليمفاوية، سرطان البروستات، سرطان البلعوم، سرطان المثانة، سرطان المبيض وسرطان البلعوم الأنفي.

إن أكثر نسب إصابات سرطانية لقبائل السودانية في عام 2007 نجدها لدى قبائل الجعلين 22.4%، الشبابية 11.2% والداقلة 9.31%. أما في عام 2008م بلحظ

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إنخفاض في نسب الإصابة لدى نفس الفئات حيث تجد قبائل الجعلين سجلت نسبة 22.3%، الشايفية نسبة 9.3% والدناقلة 8%.

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<td>ACCIS</td>
<td>Automated Childhood Cancer Information System</td>
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<td>BCR</td>
<td>Benghazi Cancer Registry</td>
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<td>Blad</td>
<td>Bladder</td>
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<td>B. Tum</td>
<td>Brain Tumor</td>
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<td>Brt</td>
<td>Breast</td>
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<td>B. Tum</td>
<td>Bone tumor</td>
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<tr>
<td>Cx</td>
<td>Cervix</td>
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<tr>
<td>CNS</td>
<td>Central Nervous System</td>
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<tr>
<td>CML</td>
<td>Chronic Myeloid Leukemia</td>
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<tr>
<td>DNA</td>
<td>Deoxyribonucleic acid</td>
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<tr>
<td>EMR</td>
<td>Eastern Mediterranean Region</td>
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<td>EBV</td>
<td>Epstein–Barr virus</td>
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<td>Exc.NMSC</td>
<td>Excluding <a href="#">Non-Melanoma Skin Cancer</a></td>
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<td>HAAs</td>
<td>Haloacetic Acids</td>
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<tr>
<td>HHC</td>
<td>Human Hepatocellular Carcinoma</td>
</tr>
<tr>
<td>HIV\AIDS</td>
<td>Human Immunodeficiency Virus, Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>HPV</td>
<td>Human Papilloma Virus</td>
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<td>ICD – O</td>
<td>International Classification of Diseases</td>
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