

**Sudan University for Science and Technology
College of Graduate Studies**

**Epidemiological Distribution of Cancer in Sudan in 2007-
2008 RICK**

التوزيع الوبائي للسرطانات فى السودان 2007-2008

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

:By

Mawada Mohammed Ibrahim

B. Sc. in Radiation Therapy

:Supervisor

.Mohammed Ahmed Ali, Ph. D

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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
 $y = 0.081x + 4.780$

to following equation as example 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 إعتد هذا البحث الخاص بنسب ومعدلات الأمراض السرطانية فى السودان, إعتقادا كليا على البيانات والإحصائيات المتوفرة لدى مركز العلاج بالأشعة والطب النووى بالخرطوم ما بين عامين 2007 و 2008 ميلادية.

كشفت هذه البيانات والإحصائية والعلاقات الترابطية حقائقاً دامغة يمكن حصرها فى الاتى:-

-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 فى هذا العام 30.6% يليه سرطان عنق الرحم بنسبة 10%.

-خلال العام 2008م أظهرت البيانات أن نسب عموم السرطانات فى المركز تمثلت عند الرجال بسرطان الدم الأبيض بنسبة 11.9% ثم البروستات بنسبة 10.5% ثم سرطان الغدد اليمفاوية بنسبة 7.7% وأخيرا سرطان الجلد بنسبة 6.5% عند نفس الفئة الذكورية. وإستعراضا للفئة النسوية لنفس العام تبين ان عموم الإصابات السرطانية عندهن تمثلت فى سرطان الثدي بنسبة 30.1% ثم سرطان عنق الرحم بنسبة 11.8%.

ل قد تبين أيضا أالإصابات السرطانية ذات الصلة بالعمر يمكن أخذها كنموذج حيث تم إعتماد المعادلة $y = 0.081x + 4.780$ حيث y ترمز للعمر بينما ترمز x نسبة الإصابة المؤوية. فى سنة 2007 نجد فى ولاية الخرطوم ل قد تمت دراسة هذه الإصابات ذات الصلة بعمر المصاب فى أواسط الفئة العمرية 55-60 والتي بلغت نسبة 10% بينما إنخفضت النسبة عند الفئة العمرية ما بين 60-65 حيث بلغت 9.6%. كما تمت دراسة نفس البيانات الخاصة بالعلاقة العمرية والأصابة بالسرطان فى ولاية الجزيرة حيث تبين الاتى: بلغت نسبة الإصابة 10.8% عند الفئة العمرية ما بين 60-65 و نسبة 10.6% عند الفئة العمرية ما بين 55-65 أما فى شمال السودان خلال العام 2007م نجد أن النسب أدناه هى المتوفرة والدالة على علاقة الإصابات السرطانية بالعمر:-

فى الفئة العمرية 55-65 بلغت النسبة 12.1%.

فى الفئة العمرية 60-65 بلغت النسبة 11.8%.

فى الفئة العمرية 65-70 بلغت النسبة 11.1%.

اما فى ولاية النيل الأبيض فنسب الإصابة فى العام 2007متباينت ما بين 12.2% للفئة العمرية (50-55) عام ونسبة 9.8% للفئة العمرية (55-60) عام.

وفى جنوب السودان تباينت النسب أيضا اذا بلغت 13.4% عند الفئة العمرية (55-60) عام وإنخفضت إلى 11% عند الفئة العمرية (45-50) عام. وفى نفس العام أيضا, إختلفت نسب الإصابة السرطانية حيث بلغت 13.4% للفئة العمرية (50-60) عام ثم نسبة 10.1% للفئة العمرية (40-45) عام.

كما نجد أيضا فى شرق السودان-نفس العام- أن نسبة الإصابة قد بلغت 14% عند الفئة العمرية (45-50) عام و 13.7% للفئة ما بين (60-65) عام وأخيرا 11.1% للفئة العمرية (55-60) عام.

وفى كردفان بلغت نسبة الإصابة 11% للفئة العمرية (65-70) عام و (55-60) عام على التوالى بينما بلغت الفئة العمرية (40-45) عام نسبة 10.3%.

أما حالات الإصابة السرطانية حسن العمر للعام 2008م جاءت على النحو التالى:

فى ولاية الخرطوم إنحصرت حالات الإصابة بالسرطان الى حد كبير ما بين الفئة العمرية 60-65 عام بنسبة 10.6 % والفئة 55-60 عام بنسبة 10.3%. أما فى ولاية الجزيرة فكانت النسب 11.6% للفئة العمرية 45-50 عام وفى ولاية الشمالية بلغت نسبة الإصابة 10.9% عند الفئة العمرية 65-70 عام ونسبة 10.8% للفئة 45-50 عام ونسبة 10.5% للفئة 60-65 عام ثم نسبة 10.2% للفئة 55-60 عام. أما فى ولاية النيل الأبيض فكانت الفئة العمرية 60-65 عام هى الأكثر إصابة بنسبة 11.8% بينما تفاوتت الفئات العمرية فى الإصابة فى ولاية النيل الأزرق حيث بلغت 10.9% للفئة العمرية 35-40 عام ونسبة 10.5% للفئة 55-60 عام ثم 10.1% للفئة 60-65 عام. أما فى جنوب السودان نجد لأن نسبة الإصابة الأكثر شيوعا 17.6% كانت اواسط الفئة 55-60 عام ثم نسنة 13.5% للفئة 45-50 عام واخيرا نسبة 10.8% للفئة 50-55 عام. أما فى دارفور نجد أن نسبة الإصابة هى 12% للفئة العمرية 40-45 عام و 11% للفئة العمرية 50-60. وإختلفت نسبة الإصابة فى شرق السودان حيث بلغت 14.8% للفئة العمرية 45-50 ونسبة 10.3% للفئة العمرية 40-45. كما أن هناك إنتشارا للإصابة السرطانية فى كردفان عام 2008م حيث بلغت النسبة 11.4% فى اواسط الفئة العمرية 60-70 ونسبة 10.8% للفئة 55-65 و 50-45 على التوالى.

أنواع السرطانات الأكثر شيوعا عند قبائل السودان المختلفة خلال 2007&2008 هى: الدم الأبيض، سرطان الثدي، سرطان عنق الرحم، سرطان الغدد اليمفاوية، سرطان البروستات، سرطان البلعوم، سرطان المثانة، سرطان المبيض وسرطان البلعوم الأنفى.

إن أكثر نسب إصابات سرطانية للقبائل السودانية فى عام 2007 نجدها لدى قبائل الجعليين 22.4%، الشايقية 11.2% والدناقلة 9.31%. أما فى عام 2008م نلاحظ

إنخفاض فى نسب الإصابة لدى نفس القبائل حيث نجد قبائل الجعليين سجلت نسبة 22.3% ,الشايقية نسبة 9.3% والدناقلة 8%.

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List of Abbreviation

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

for Oncology

IAEA	International Atomic Energy Agency
Larx	Larynx
Lekmia	Leukemia
Lphoa	Lymphoma
M: F	Male: Female
NCI	National Cancer Institute
NIEH	National Institute of Environmental Health
NHL	Non-Hodgkin's lymphoma
PBDEs	Polybrominated Diphenyl Ethers
PSA	Prostate-Specific Antigen
RICK	Radiation Center
SCS	Saudia Cancer Society
Stom	Stomach
THMs	Trihalomethanes
Thyro	Thyroid
UK	United Kingdom
USA	United State of America
UV	Ultraviolet
VH	Viral Hepatitis
WHO	World Health Organization

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