

## Special Article

### Cancer Management in Sudan: Current Status and Future Perspectives

Dafalla Omer Abuidris<sup>1</sup>, Anas Osman Ahmed<sup>2</sup>, Ahmed Elkhidir Elmadani<sup>3</sup>,  
Elgaylani Abdalla Eltayeb<sup>4</sup>, Elgaili Mohamed Elgaili<sup>5</sup>, Nasreldin Abdalla  
Elwali<sup>6</sup>, Kamal Eldein Hamed<sup>7</sup>.

#### Abstract

**Introduction:** Sudan is one of the developing countries that face a great challenge with cancer management. About 5700 cases had been seen during year 2007 in Radiation and Isotope Center- Khartoum (RICK) and Institute of Nuclear medicine, Molecular biology, and Oncology (INMO) Wadmedani which are the only cancer centers in Sudan.

**Purpose:** Aim of this work is to highlight the difficulties of cancer management in Sudan and to propose possible solutions.

**Methods:** This paper evaluates the current situation of cancer management in Sudan through reviewing of data available in cancer centers and reports from the Sudan national bureau of statistic. Suggestions are also made for cancer control plan in Sudan having the current situation in mind and guided by the published international data on cancer control.

**Results:** The preliminary analysis of the available data reveals that Sudan has very limited resources available to deal with cancer and the service provided is not evenly distributed.

**Conclusion:** Establishment of new centers is extremely needed with special attention to good distribution of services. To achieve such a goal training of more staff and upgrading of the existing centers is mandatory to manage all types of cancer. Cancer registry is the right way to plan for cancer control in Sudan.

**Keywords:** Nuclear medicine, radiation, oncologist.

Cancer is an immense problem facing the whole world and a notorious human being killer. According to World Health Organization (WHO) and international association against cancer (UICC); 12.5% of all deaths in world are due to cancer (more than malaria, TB, and AIDS together). There were 10.9 million cancer cases worldwide in 2002 and more than 16 millions are estimated for year 2020.

About 60% of cancer cases in 2020 are going to be in developing world. Eighty to ninety percent of cancer cases in developing countries present late and advance. Thirty percent of cancer cases can be cured if it presents in early stage<sup>1,2</sup>. Sudan is the largest state in Africa with a population exceeding 40,000,000 (Est.july2005)<sup>1</sup>. It has endured civil wars for more than 23 years; this made its limited resources even worse. On the other hand, the oil production may boost its economy especially when joined with the end of civil wars. One third of people in Sudan live centrally however, the remaining two thirds scattered all across this large country (about one million mile square).

Health service planning is so difficult because of people distribution, nomadic nature of some people and country limited recourses.

1- Head department of Radiation oncology, Institute of Nuclear Medicine, molecular Biology and Oncology (INMO)-University of Gezira.

2- Radiology, INMO, University of Gezira.

4- Radiation oncology, INMO.

3- Nuclear Medicine, INMO, University of Gezira.

5- Pathology, Faculty of Medicine, University of Gezira.

6-Molecular Biology, INMO, University of Gezira.

7- Radiation oncology, University of Khartoum.

Correspondence to:E.mail: [abuidris@yahoo.com](mailto:abuidris@yahoo.com)

Forty percent of the population is under poverty line and the unemployment exceeds 18%<sup>2</sup>. Most of the professionals are working in Khartoum, Sudan Capital, and this is another challenge for health service authority.

Till recently, cancer use to be the least health problem and most of efforts are towards tropical and infectious diseases. Now, cancer is an obvious health problem which drew the attention of both the health professionals and public due to increasing numbers of new cases and deaths caused by cancer<sup>3</sup>. Although only less than 6000 cases had been treated in year 2007 in Sudan cancer centers but this may be the tip of the iceberg (Table 1).

Table 1: number of patients treated in cancer centers (RICK& INMO) over the last 7 years.

Years	RICK	INMO.
2001	2961	364
2002	3074	402
2003	3308	451
2004	3905	520
2005	3505	660
2006	4381	824
2007	4856	850

Many cases are hidden, probably undiagnosed, or couldn't find their way to the limited-health facilities.

Another problem is the late presentation of the majority of cases, partly due to lack of good quality health service particularly in the periphery of Sudan, this goes together with the major issues of ignorance and poverty. Sudan needs nearly eight centers according to WHO statement (one center for each 5 million population).

This work focused on the existing cancer service capabilities and suggested the needs for cancer control in the whole country.

#### **Methodology of this study:**

The authors are health professionals working in the two cancer centers in Sudan. All data is collected from the

available resources in the cancer centers by looking into hospital annual reports and direct contact with the administrative and staff members. RICK was established in 1967. The second center, INMO, was established in Wadmedani in 1999. Data about the population estimation and country demography were obtained from the Sudan Central Bureau of statistic in Wadmedani branch. Other information sources include the international internet network and some scientific papers.

The study presents all available useful data to through light on the existing service available in Sudan and the needs for the future planning of cancer service in the country. The main input of authors was on providing these facts to public and decision makers and to make use of the available international literature for how to improve situation in Sudan and probably other similar countries.

#### **Results:**

##### **Facts about present situation in Sudan: (personal communication RICK & INMO STAFF- 2007)**

- There are only two centers for cancer in Sudan.
- Both centers are located in center of Sudan (180 Km apart)
- The number of equipments is small in both centers. In INMO there are two machines one Cobalt 60 and one Linear accelerator. In RICK there are two Cobalt 60 machines and one Linear accelerator on service. There is only one conventional simulator on service in Wadmedani-INMO and one CT-simulator at RICK.
- Number of specialized radiation oncologists is small (eight in all Sudan up to 2007).
- Number of clinical hematologists is small, only two with one working to the State and the other works in private sector. Private sector provides only consultation for cancer patients.
- There is no full time medical Oncologists, all are clinical oncologists.

- Summary on data about available resources and capabilities of the two cancer centers in Sudan is shown in table 2. Different regions of Sudan with respect to the population size and distance from the available cancer centers shown in table 3. (personal communication-Central Bureau of statistics-Wadmedani branch)
- The majority of cancer patients seen in Sudan presented late with advanced disease.
- Late presentation may be due to lack of regular organized health education about cancer; also poor socioeconomic factors may play a role.
- Poor Knowledge about cancer among public and many health professionals, and this can be explained by domination of late presentation.
- Out of the 25 medical schools only five have proper courses on oncology and early detection (5 Faculties has oncologists).

- No systemic continuous program for cancer awareness campaign.
- Lack of population-based cancer registry at national or regional levels. Sudan had a good institutional-based cancer registry till 1983, and stopped after that (personal communication – Federal Ministry of health).
- Inpatient service for cancer patients is limited and many people do not afford payable stay or even the traveling cost.
- Registries from cancer centers in Sudan reported 5702 treated new cases in 2007, while expected number for this country with a population of nearly 40 Million is far more than this (WHO estimation was 1/1000 cancer cases in population).
- Lack of cancer registry in Sudan makes planning for cancer control extremely difficult.

Table 2: quality of service available in cancer centers

Name of center	EBRT Machines	BCT Machines	Radiation Oncologist	MP	HO	MO	PO	TN	TR	Work shifts on machines
RICK	4	1	10	6	1	0	1	8	60	3
INMO	2	1	3	4	0	0	0	10	10	2

EBRT= External Beam Radio-Therapy. BCT=Brachy-Therapy. MP= Medical Physicist. HO= Hemato-Oncologist. PO= Pediatric Oncologist. MO= Medical Oncologist TN= Trained Nurse. TR= Trained Radiographer.

**Future perspectives**

To improve the current situation of cancer control in Sudan the following steps are needed:  
 Firstly: Increasing cancer treatment centers by making use of International Atomic Energy Agency (IAEA) multi partner program of action for cancer therapy (PACT) <sup>4</sup>.

Establishing centers in strategic cities (according to location and population density), which have good medical service infrastructure and back up. Upgrading of the existing centers by providing more new machines, rising staff training chances and increasing the inpatient facilities is mandatory.

Table 3: Sudan regions and distribution of population, site and service

Region	Population %	Distance from nearest CC (KM)	Number of CC
Central	21.5	150	1
Darfour	19	1200	0
Khartoum	16	40	1
Southern	15.5	1350	0
Eastern	11.6	900	0
Kurdofan	11.4	900	0
Northern	4.6	900	0

Central region: Gezira, Sinnar, White Nile, and Blue Nile states.  
 Darfor region: west Darfour, north Darfour, and south Darfour states  
 Southern region: The ten southern states.  
 Eastern region: Red sea, Kassala, and Gadarif states.  
 Kurdofan region: North kurdofan, south kurdofan, and west kurdofan states.  
 Northern region: River Nile and northern states.  
 CC= cancer center. KM= kilometer.

Secondly: Prevention and early detection, are corner stone for cancer control, can be achieved through increasing the awareness of medical personnel and public by making use of the media, health institutions, Non Governmental Organizations (NGO) in addition to community development groups. Oncology courses should be incorporated in all medical schools curricula with special emphasis on early detection, palliative care and prevention.

Prepare short teaching courses to upgrade cancer knowledge among medical assistants and paramedical personnel.

Make use of United States Institute of Medicine published report on cancer-control opportunity in low-income and middle-income countries, Institute of medicine of the National Academy.

Thirdly: Increase numbers of trained oncologist, medical physicist, radiation technologists (radiotherapists) and oncology-nursing staff through local and foreign collaboration to improve the

service, treatment outcome and palliative care, and set treatment guidelines<sup>5</sup>.

Fourthly: Improving professional environment should help lessen the flight of health professionals to high-income countries<sup>6</sup>.

Last, but not least, make 10 years strategic plan for cancer control and treatment in Sudan considering existing resources and both present and future needs.

Establish cancer registry as soon as possible through collaboration with WHO expertise in Lyon-France, International Agency for Research and Training in Cancer-IARC ([www.iarc.fr](http://www.iarc.fr)), to provide the planner with good insight about the problem and bring policy makers attention towards cancer calamity.

Allocate annual budget from National budget for cancer control, treatment and research to fill the gap between Sudan and other countries with well established cancer control programs and treatment set up.

**Conclusion**

Cancer control is a real challenge for developing countries especially in very large and developing country like Sudan.

With proper planning, international collaboration and good health system the cancer control initiative can reach its goals.

National support and community contribution are both indispensable to fill the gap between requirements and limited resources.

Sudan needs more than 5 new cancer centers and to be distributed fairly all over the country.

Cancer registry needs an Act from the government to accelerate this process which needs collaborative work from medical professionals, statisticians, governors and public.

**Acknowledgement:**

We thank all institutions who were cooperative with us during data collections and we notify the following institutions:

1. Medical research and information centre –INMO.
2. Statistic and medical information unit in RICK.
3. Central Bureau of statistics (CBS)-Khartoum and UNFPA, Wadmedani branch.
4. Staff of both centers in RICK and INMO.

**References:**

1. D. Max Parkin, Freddie Bray, J. Ferlay et al. Global Cancer Statistics, 2002, CA Cancer J Clin 2005; 55:74-108.
2. Levin V, Meghzifene A, Izewska J et al. Improving cancer care: increase need for radiotherapy in developing countries. IAEA Bulletin; 2001; 43 (2): 25-32.
3. Hamad HM. Cancer initiatives in Sudan. Ann Oncol 2006; 17: viii32–viii36.
4. Epping-Jordan JE, Galea G, Tukuitonga C et al. Preventing chronic diseases: Taking stepwise action. Lancet 2005; 366(9497):1667–1771.
5. Anderson BO, Shyyan R, Eniu A, et al. Breast cancer in limited-resource countries: an overview of the Breast Health Global Initiative 2005 guidelines. Breast J 2006;12:Suppl 1:S3-S15.
6. Ian Magrath. Building capacity for cancer control in developing countries: The need for a paradigm shift. The Lancet Oncol 2007; 8:262-263.