RESEARCH ARTICLE

Boosting Cancer Survival in Nigeria: Self-management Strategies

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Abstract

   Cancer is a menace fast gaining momentum in Nigeria and other developing countries. It is an expensive disease requiring a major financial and human resources for prevention, diagnosis and treatment. With no national policy on cancer control in the country, incidence (111.7/100,000 population) and mortality (86.6/100,000) rates in Nigeria are spiraling beyond control. This literature search study was primarily aimed at providing recommendations on cost-effective strategies for development interventions to promote self-management for cancer survivors in Nigeria with a goal to improve quality of life and overall survival.

Keywords: Cancer - Nigeria - survival - incidence/mortality - lifestyle changes - self-care

Introduction

   Cancer is a chronic illness which is fast increasing in incidence and is predicted to be a worldwide important cause of morbidity and mortality in the next few decades, especially in low and middle-income countries (IARC, 2011). WHO (2008) reported that about 24.6 million people live with cancer worldwide with approximately 12.5% of all deaths attributable to cancer and if the trend continues, it is estimated that by the year 2020, 16 million new cases will be diagnosed per annum with 70% from developing countries. Cancer has a wide variety of risk factors including: environmental and occupational exposures; Hepatitis B & C (liver cancer); Helicobacter pylori (stomach cancer); Human papilloma virus (HPV; cervical cancer); etc., however the most common risk factors are modifiable health behaviors including: tobacco use; excessive alcohol consumption; insufficient physical activity and unhealthy diet (WHO, 2008).

   With the evolution of medical science and technology, advances have been made in the diagnosis and treatment of cancer regardless of the cancer site. This has led to a large number of survivors especially in developed countries where great success have been achieved. Approximately one in every 25 Americans is now a cancer survivor and the United Kingdom records a 51% survival rate for all cancer types (Howlader et al., 2011; Cancer Research UK, 2013). Research and interventions on ensuring long-term survival and preventing recurrence while maintaining high quality of life among survivors have commenced in earnest.

   The American Cancer Society (2012a) defined a cancer survivor as anyone who has been diagnosed with cancer, from the time of diagnosis to the end of initial treatment and the transition from treatment to extended and long-term survival. In this paper however, the term cancer patient and survivor are used interchangeably.

Materials and Methods

Aim

   This study reviews the epidemiology of cancer in Nigeria, providing recommendations on self-management strategies for survivors aimed at improving quality of life and overall survival.

Literature Search

   Relevant articles were identified by searching several databases: PUBMED, MEDLINE and Cochrane Library. Information was also retrieved from the websites of international agencies and non-governmental organizations as well as reference lists of eligible articles. Key search terms included synonyms of the following words: cancer; Nigeria; survival; incidence/mortality; lifestyle changes and self-care, which were used in various combinations.

Results

Epidemiology of Cancer in Nigeria

   Incidence, Prevalence and Mortality: Nigeria, the most populous country in Africa (Central Intelligence Agency, 2013), is experiencing a rapid rise in cancer incidence with approximately 102,000 new cases per annum, closely rivaled by the mortality rates of 75,000 deaths per annum (GLOBOCAN, 2008). A recent study on cancer

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Table 1. Common Cancers in Nigeria by Sex

	Ibadan Registry	Zaria Registry	GLOBOCAN overall summary (2008)
Male	Prostate 23.5%	Liver 19.9%	Prostate 18.2%
	Liver 11.6%	NHL 15.9%	Liver 15.7%
	NHL 10.3%	Bladder 9.3%	Colorectum 7.8%
		Prostate 7.5%	NHL 7.4%
Female	Breast 35.3%	Cervix 24.8%	Breast 30.7%
	Cervix 24.4%	Breast 20.5%	Cervix 24.6%
	Ovary 4.7%	NHL 7.9%	Liver 4.6%
			Colorectum 3.5%
			NHL 3.3%

Sources: GLOBOCAN, 2008; Parkin et al., 2003; Awodele, 2011; Kolawole, 2011

incidence in Nigeria (Jedy-Agba et al., 2012) identified age standardized incidence rates from two population based cancer registries to be approximately 62.35/100,000 men and 134.6/100,000 women. Estimated incidence and mortality rates for the year 2020 are lower in Nigerian men (72.7/100,000) than women (76/100,000) (Parkin et al., 2003).

The graph in figure 1 above shows that most cancers in Nigeria have high mortality rates especially in the case of liver cancer which appears to have a zero survival rate. This is hardly surprising considering the many problems faced by the country's cancer care and health care system in general.

Common cancers in Nigeria in descending order of incidence/frequency include: breast, cervical, prostate, liver, colorectal and Non-hodgkins lymphoma (NHL) (Abdulkareem, 2013). While the most common in males are prostate and liver cancer, females mostly battle breast and cervical cancer as indicated in table 1 above (GLOBOCAN, 2008).

Breast cancer, currently the most common cancer in the country occurs more in women with increasing age. It usually presents as breast lump or bloody nipple discharge with risk factors ranging from early menarche, obesity, lower levels of physical activity, nulliparity, smoking, alcohol, use of hormone replacement therapy, etc. (Kolawole, 2011). Women diagnosed with breast cancer are also at high risk of cardiovascular disease and diabetes, conditions for which weight gain is a risk factor (Brown et al., 1993).

Cervical cancer, the second most common cancer in Nigeria is mostly caused by an infection with Human Papilloma Virus (HPV) leading to invasive cancer 10-15 years after infection (Parkin et al., 2003). Other risk factors include: early commencement of intercourse, multiple sex partners, high parity, poverty, smoking and use of hormonal contraceptives (Kolawole, 2011).

Prostate cancer incidence is also on the rise with a vast majority of the population unaware of prostate cancer screening or serum prostatic surface antigen (PSA) testing (Akinremi et al., 2011). Studies in various states in Nigeria have shown the disease to be at a 7.7-fold increase in a 10 year period with late presentation and poor outcomes (Ogunbiyi, 2011). Associated risk factors include: age, family history, high consumption of fat and red meats (Kolawole, 2011).
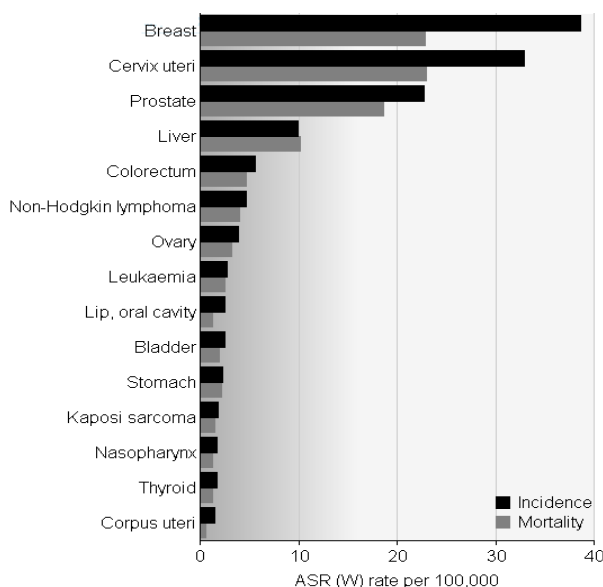
Figure 1. Nigeria Estimated Age-standardized Cancer Incidence (Source: GLOBOCAN, 2008)

Liver cancer has risk factors ranging from infection with Hepatitis B or C viruses to alcohol use and food contamination by Aflatoxin fungus (Kolawole, 2011).

Colorectal cancer is also no longer a rare disease in Nigeria as evidenced in a review which showed that out of 241 cases in the last 30 years, 93 cases were seen in the last 5 years (Ibrahim et al., 2011).

Diagnosis, Treatment and Survival: Cancer diagnosis and treatment constitute vital areas in cancer control. Baby steps are still being taken in the diagnosis, treatment and control of cancer in Nigeria. This is due to an array of issues faced by the country's field of oncology, ranging from limited number of oncology specialists to lack of finances, equipment's and other resources required for cancer care (Adebamowo, 2013). Nigeria has no national policy on cancer (Eguzo et al., 2012) and as cancer care is generally costly and resource-intensive, facilities and equipment's available in the country for care are scanty and unevenly distributed, with effective drugs either unavailable or too pricey.

Primary and secondary prevention strategies ranging from vaccination (e.g. Hepatitis B vaccine for liver cancer; HPV vaccine for cervical cancer) to screening programs (e.g. mammography for breast cancer and PSA testing for prostate cancer) are either absent, poorly implemented or too costly in most parts of the country. A recent study on female healthcare workers in Nigeria showed HPV vaccination to have higher acceptability compared to cervical screening but, there is still a low level of awareness and neither is readily available nor affordable (Ugwu et al., 2013). Resources, though minimal, are being channeled into treatment and management of the diagnosed where available. The efforts are however, hardly useful as most patients present with advanced stage of disease on diagnosis.

An amalgamation of illiteracy, ignorance, poverty, non-utilization/ poor management of screening services, among others, are some of the factors leading to late presentation and poor treatment outcomes of most cancers in Nigeria (Adisa et al., 2012; Adebamowo, 2013; Eze et

al., 2013). The lack of a system of health care financing and shared risks, has led to families bearing cancer care costs through spending savings and investments, borrowing at high economic and social costs, and sale of resources like homes and investments; thereby making cancer an important risk factor in poverty and loss of social status among the middle class (Adebamowo, 2013).

Cancer diagnosis in Nigeria is akin to a death sentence as survival rates are almost non-existent. National cancer control plans in Nigeria, though yet to be implemented, are well conceived and generally follow WHO recommendations; however, they omit the control of risk factors for both survival and prevention of recurrence (Stefan et al., 2013). With so much attention focused on treatment, little or no attention is paid on prevention, long-term survival and quality of life. While many developed countries report millions of cancer survivors with approximately 68% of Americans diagnosed with cancer now living for more than 5 years (Siegel et al., 2012), those able to receive/afford treatment in Nigeria, are faced with issues of treatment adverse effects, disease progression or recurrence and other health outcomes (Pekmezi et al., 2011). There is no data on cancer survival rate in Nigeria especially with the absence of a national cancer registry; however inferences can be drawn based on the available incidence and mortality statistics.

Self-management Strategies after Diagnosis: Self-management is a component of self-care that is informed by evidence-based health information supplied to individuals to care for their own health and wellbeing (Australian Government Department of Health and Ageing, 2009). The National Health Service, UK (NHS, 2005) describes self-care as the actions individuals and carers take for themselves, their children, their families and others to stay fit and maintain good physical and mental health; meet social and psychological needs; prevent illness or accidents; care for minor ailments and long-term conditions; and maintain health and wellbeing after an acute illness or discharge from hospital.

Cancer is a chronic condition with persistent or recurring health consequences lasting for years (Summer et al., 1999). It calls not only for immediate professional care but also for aggressive self-management strategies. Survivors need to be engaged in post-diagnosis disease self-management and self-care strategies in collaboration with their health care providers. This should serve as an adjunct therapy to surgery, chemotherapy and other cancer treatment options regardless of the cancer stage. Many countries, including Malaysia (Loh et al., 2010) are already developing self-management support strategies to enable survivors cope effectively and reduce the long-term impact of cancer. Most self-management strategies are focused on lifestyle factors including: excess weight, physical inactivity, poor diet, smoking and alcohol consumption which are increasingly being implicated in the development of many cancers and prognosis.

While cancer survivorship is a relatively new area of study and much needs to be learned regarding the optimal diet and physical activity practices for cancer survivors, current evidence supports recommendations in 3 basic areas: weight management, physical activity, and dietary patterns (Rock et al., 2012). The World Cancer Research Fund (2009) has estimated that 27-39% of cancers can be prevented by improving diet, physical activity and body composition. The relationship between these lifestyle factors and issues of cancer recurrence, development of second primary cancers, comorbid conditions, quality of life and overall survival have been widely researched (Chan et al., 2005; Sonn et al., 2005; Davies et al., 2011) and though some evidence may still be lacking, useful conclusions and recommendations can be drawn especially as the factors are modifiable.

Weight Changes

Cancer can cause both weight loss and weight gain due to factors ranging from: loss of appetite, anorexia, inactivity, electrolyte imbalances, fluid retention, steroids contained in the drug regimen, etc. Maintenance of a normal body mass index (BMI) is a vital factor in cancer outcomes and general health in survivorship. Excess weight and obesity have been associated with an increased risk of developing many cancers, including cancers of the breast in postmenopausal women; colon and rectum; endometrium; esophagus; kidney; pancreas; gallbladder; liver; cervix; ovary; non-Hodgkin lymphoma; multiple myeloma and aggressive forms of prostate cancer (World Cancer Research Fund, 2007; Norat et al., 2010; Kushi et al., 2012; Rock et al., 2012).

Several researches on breast cancer survivors showed that those with increased BMI had a significantly higher risk of recurrence and all-cause mortality compared to survivors with a stable weight (Adebamowo et al., 2003; Kroenke et al., 2005). Significant trends between increasing BMI and death from colorectal, breast, and prostate cancer, among other cancer sites, was also reported in the Cancer Prevention Study II, a prospective cohort of more than 900,000 adults followed for 16 years (Calle et al., 2003). Gradual weight loss has proven to be beneficial in controlling hypertension, cardiovascular disease, hyperinsulinemia, pain, dyslipidemia, and improving levels of physical functioning, all of which are conditions that are reportedly common among cancer survivors (Brown et al., 2003).

Weight Recommendations: Primary ways of preventing weight gain or treating obesity are by physical activity and healthy diet. The American Cancer Society (ACS, 2012b) recommends that survivors achieve and maintain a healthy weight by limiting consumption of high-calorie foods and beverages and increasing physical activity to promote weight loss. Body mass index (BMI) of 25-29kg/m or above should be avoided and a stable weight should be maintained (Davies et al., 2010).

Physical Activity

Evidence has proven that insufficient physical activity causes a 20-30% increased risk of all-cause mortality and has been attributed to 3.2 million annual deaths worldwide (WHO, 2012). In the past, plenty of rest was recommended for cancer treatment and recovery however, this was overemphasized and led to most patients having insufficient physical activity which in turn led to loss of

Table 2. List of Some Cancer Recommended Foods Readily Available in Nigeria

Food category	Examples	Anti-cancer nutrients
Fruits	Oranges; Grapes; Lemon; Pineapples; Water melon; Avocado; Sour sop; Apples; Mangoes; Guava; Paw-paw; Garden egg (Anara) etc.	Fiber, antioxidants, phytonutrients
Vegetables	Greens: Lettuce; Spinach; Water leaf; Bitter leaf; Eggplant leaves; Koko vine leaves (Okazi/ Afang); Fluted pumpkin leaves (Ugu); African joint fir vegetable (Utazi); etc. Others: Tomatoes; Colored peppers; Carrots; Cabbage; Cucumber; Onions; Garlic; Ginger; Green beans and peas; etc.	Fiber, antioxidants, phytonutrients
Beans/ Legumes/ Nuts	Brown/ white beans; Cowpea (Akidi); Soya beans; Kidney beans; Bambara nut (Okpa/ Gurujia); Breadfruit (Ukwa); Pigeon pea (Fio-fio); Walnuts (Ukpa/ Awusa/ Asala); Tropical almonds (Fruit/ Ebelebor); Tiger nuts (Aya/ Imumu/ Aki hausa); etc.	Fiber, protein, healthy carbohydrates
Whole grains	Brown rice; Local rice; Millet; Wheat; Maize; etc.	Fiber, healthy carbohydrates
Meats/ Poultry/ Dairy	Chicken; Fish; Eggs; non/low fat milk	Protein, omega-3 fatty acid

physical conditioning and muscular strength, making it difficult to perform even basic activities of daily living (Ness et al., 2006). Physical activity can improve physical function, hasten recovery from the immediate side effects of cancer treatment, prevent long-term effects, and may reduce the risk of recurrence and increase survival (Markes et al., 2006; Courneya, 2009). Besides the physiological benefits, a recent review (Demark-Wanefried et al., 2005) found that exercise is also consistently associated with positive effects on psychological/ emotional well-being, quality of life and reductions in fatigue. Its benefits have not been investigated for all cancer types but, it is known to decrease the risk of many other diseases including: diabetes, cardiovascular disease and osteoporosis/bone disease (Pekmezi et al., 2011) so, cancer survivors can only benefit from engaging in it.

The effect of exercise can however, be undermined in the absence of a healthy diet and weight management. There is also a need for prudent guidance for moderate physical activity especially for those in active treatment. Exercise Recommendations: Survivors are advised to avoid inactivity and return to normal daily activities as soon as possible following diagnosis, aiming to exercise at least 150 minutes per week. Exercise can progress from low intensity (e.g. stretching and small walks) to moderate intensity (e.g. jogging, running, swimming, general house chores like sweeping or mopping, etc.) and those who are unable/ too weak to exercise should request physical therapy (American Cancer Society, 2012b).

Diet

A healthy diet is associated with good health. Various nutrition studies among cancer survivors have associated low-fat, high fruit-vegetable diets to lower rates of cancer recurrence (Chlebowski et al., 2006; Meyerhardt et al., 2006; Pierce et al., 2007; Ornish et al., 2008). Increased fruit and vegetable consumption also facilitates weight management and those containing carotenoids (e.g. tomatoes) have strong evidence of anti-cancer benefits (Schwarz et al., 2008; Davies et al., 2010).

To effectively achieve the survival and disease prevention goal for cancer survivors, improving overall dietary pattern as opposed to single nutrient or individual dietary constituents' maybe the best nutritional strategy (Appel et al., 1997). The dietary patterns should generally include the quality, quantity, and proportions of foods and beverages consumed in the diet as well as the frequency of consumption (Kant, 2004). Some symptoms such as anorexia, early satiety, changes in taste and smell, and disturbances of the bowel are common side effects of cancer and cancer treatment and can lead to inadequate nutrient intake and subsequent malnutrition (Rock et al., 2012). Therefore, depending on individual cancer stage and symptoms, one should consume enough nutrients and calories to nourish the body and prevent weight loss or gain. The use of dietary supplements are not advised except in the treatment of a particular deficiency as many supplements contain nutrient levels which exceed that recommended for optimal health and so may be detrimental to survivors since they could prevent the cellular oxidative damage to cancer cells that is required for treatments such as radiation therapy and chemotherapy to be effective (Lawenda et al., 2008; Rock et al., 2012). Diet Recommendations: Cancer survivors are advised to increase fruit and vegetable consumption; reduce saturated fats; use healthy fat sources like olive oil; limit processed meat and red meat consumption; increase fish and poultry; eat whole grains rather than processed grains [Davies et al., 2010; American Cancer Society, 2012b]. More details can be obtained from the American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention. It is also recommended that smoking and excessive alcohol consumption be avoided as there is evidence associating them with cancer progression, mortality and other risk factors (Davies et al., 2010).

The table 2 above provides a list of some of the American Cancer Society recommended foods or their equivalents readily available in Nigeria, along with some of their native names. A few of the foods might be too expensive for the lower class citizen, however many of them are affordable and can easily be sourced from local farms.

Discussion

Cancer in Nigeria is marked by foreboding not only on health but also on the social and economic wellbeing of the nation. Comprehensive and feasible national cancer control strategies are already in place however, the bane of all the strategies is finance. At the moment, public expenditure on health is less than $8.00 per capita as opposed to the internationally recommended $34.00

(Federal Ministry of Health, 2005; Ogunbiyi, 2011) with little or nothing accorded to cancer care.

Cancer therapies are usually costly with significant side effects that can result in long-term morbidity therefore, non-pharmacologic methods such as participating in physical activity and other lifestyle changes to lower the risk of cancer mortality while improving quality of life and preventing other chronic diseases (Irwin, 2009), may offer an attractive means of increasing cancer survival in Nigeria and other developing worlds. Cancer diagnosis leaves the diagnosed vulnerable, creating a "teachable moment" where they are willing to learn and play a more active role in their health care (Demark-Wanefried et al., 2005; Davies et al., 2011). However, adopting these lifestyle changes may be difficult for most and even more so after a cancer diagnosis as many survivors led sedentary lives and ate whatever they pleased before diagnosis. Lifestyle counseling, though encouraged post-treatment (Costanzo et al., 2011), should be provided upon diagnosis based on the circumstances peculiar to cancer care in Nigeria with periodical nutrition and physical activity assessment to ensure implementation and continued adherence.

Recommendations for nutrition and physical activity in survivors could be generalized but are best when based on individual nutritional needs and physical abilities. For example, survivors with severe anemia should delay activity until the anemia is improved, those with compromised immune function should avoid gyms and other public places until their white blood cell counts return to safe levels, those undergoing radiation should avoid swimming pools because chlorine exposure may irritate irradiated skin (Rock et al., 2012), and those with osteoporosis/bone metastasis should exercise with care to avoid fractures. Nigeria may have no national dietary recommendations for cancer yet but adaptations can be made from existing ones such as that of the American Cancer Society in relation with the variety of foods available in the country. Also, though it may be difficult to develop a supervised exercise program for survivors in the present Nigerian cancer care, home based programs have been associated with longer term adoption and maintenance of exercise (Irwin, 2009). A healthy diet without physical activity and weight maintenance may not be sufficient to improve cancer prognosis (Patterson et al., 2010).

Temporary lifestyle changes are unlikely to have substantial effects on health, making it paramount that lifestyle support be permanently integrated into standardized models of aftercare (Davies et al., 2011). Also, though survivors may be privileged to receive information from family, friends and well-wishers or the internet on what they should eat, how they should exercise and of course, what herbal remedies to use, as is common in the Nigerian environment, the information is often inconsistent, unreliable and probably harmful. The need for lifestyle counseling (individual or group therapy) to be included in Nigeria's routine cancer care with the concerted effort of a team of multidisciplinary healthcare providers, even if they are not trained oncologists, is thus emphasized.

To successfully achieve the integration of lifestyle self-management support in the present Nigerian cancer care system, strategies involving little or no cost to the survivors and care givers should be sought. First, the Federal Ministry of Health with the help of public health professionals should develop a National guideline on lifestyle changes for cancer prevention in Nigeria. This should provide the necessary details on weight, exercise and dietary requirements for cancer prevention, based on what is obtainable in the country. The guideline should be passed as a policy to be incorporated in routine cancer care and disseminated through media advertisements; posters in hospitals/clinics; education/counseling of survivors and their family members who may also be at risk of developing cancer; etc. A lot of attention needs to be given to counseling survivors and this can be achieved through several means including:

Primary care doctors, regardless of their specialty, providing counseling to survivors tailored to their individual needs and abilities. This recommendation is based on several factors including: the limited number of oncologists in the country; doctors intimate knowledge of each patient's health status/needs/abilities; and the fact that most doctors in Nigeria, regardless of their specialty, also practice general medicine, consulting with patients suffering from different ailments including cancer and referring them to a specialist only when necessary.

Empowering nurses to provide group counseling to survivors on particular clinic days, based on the national guidelines, with their family members in attendance. The counseling sessions should include evaluation of progress and re-assessment of lifestyle goals as appropriate (Bourke et al., 2012). This should be done as often as possible to ensure long-term adherence and a wide outreach, especially for those who do not come to the clinic often.

Local and international non-governmental organizations working in collaboration with health centers nationwide, to provide assistance where possible especially in the support of training the existing and future health work force.

These interventions if implemented will go a long way in creating awareness for cancer prevention, reducing mortality, and ultimately improving quality of life and overall survival. In time, with adequate financial backing, the lifestyle support program can be expanded by establishing cancer counseling clinics and other support groups in various health centers nationwide as have been achieved with HIV, and training oncology specialists from different areas of the medical profession who will provide both education and support to survivors and ensure adherence based on their individual needs.

In Conclusion, one might rightly argue that Nigeria first has to tackle its dangerously lacking acute cancer care before pursuing means to improve overall survival. However, rather than diagnose patients with cancer and then do nothing, healthy behavior changes should be promoted. Given the evidence of the effectiveness of lifestyle modifications on cancer and health in general, promoting healthy behavior choices can hardly do the country any harm; instead it may positively impact on cancer care and overall survival in the long run. These recommendations, though not a replacement for actual

treatment, constitutes an immediate response to cancer prevention and survival; costs little or nothing and will empower survivors with self-care strategies that will improve their long-term outcomes with or without treatment considering the record number of survivors who return home after diagnosis due to inability to foot the cost of treatment (Eze et al., 2013). The strategies will also serve to educate the general cancer-free population about cancer and its risk factors.

Clinical trials may be carried out to evaluate the feasibility and efficacy of lifestyle interventions in the management of cancer patients in Nigeria.

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