

Ethnic differences in Colon and Rectal Cancer incidence in Nigeria: a case of dietary determinants?

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Colorectal cancer has for a long time occurred at lower rates in the native African than in Caucasians. The reasons adduced have included the lack of premalignant conditions like polyps and ulcerative colitis and majorly to the high fibre, low animal protein diet that Africans consume. Nigeria has a low colorectal cancer incidence and within this milieu the incidence between the various ethnic tribes also varies with some particular tribes exhibiting negligible incidence rates. If moving from a location of low colorectal cancer incidence to one of high colorectal cancer incidence predisposes one to develop the disease, could not the converse apply and those with a predisposition to developing the disease experience some protection when they live or interact with those with negligible predisposition? This study was aimed at giving an impetus to research on the peoples of the riverine areas of Nigeria in a bid to unravel the cancer-preventive factors either in their diet or environment for the good of those from the Western world.

Introduction

Colon and rectal carcinoma are not common in native Nigerians when compared to the incidence of this disease in the United States (US) and the United Kingdom (UK). Nevertheless studies in Nigeria have shown increased rates of this disease over the last 20 years^{1,2}. This increase has been hinged on change in the hitherto rural lifestyle and diet to the more urban and Caucasian type. Over the last 20 years, colorectal cancer (CRC) in Nigeria was not within the top 10 cancers; recently it became the 4th most common cancer in Nigeria². Yet the rates seen in Nigeria and indeed Africa in general are not up to a thirtieth of what obtains in the western world. Reasons adduced have included the native African diet and lack of premalignant colorectal lesions.

Within this Nigerian microcosm of colorectal cancer cases it has been observed that a difference in incidence also exists between the various ethnic groups in the country. We do know that foodstuff and diet are peculiar to the various ethnic groups in this country and exposure to and adoption of western lifestyle is not the same in these ethnic groups. If indeed the diet of a certain ethnic group prevents the development of colorectal cancer then it is worthwhile to study this in detail. Migration studies have shown that persons who migrate from a place of low CRC incidence to one of high incidence ultimately develop the disease or their offspring do. Thus why not conversely? If it can be highlighted that certain geographical locations have a very low incidence because of the diet consumed there then it should be possible to reduce the incidence of CRC in patients with a high risk if they migrate to these places with low incidence.

The rationale for this study is to highlight such a pattern and lay the ground for a prospective study to see the effect e.g. high risk patients with colonic polyps spending 3 months in such a site, eating the native food and afterwards comparing the pre- and post-visit colonoscopy appearances. The University College Hospital in Ibadan, a tertiary care institution is located in the largest city in West Africa and is adjudged to be a place which is cosmopolitan enough to represent the diverse variety of ethnic groups in the country as a whole. The hospital serves the whole of Ibadan (population of 2.5 million) and its environs and also receives referrals from all over Nigeria.

Patients and Methods

This was a retrospective study utilising the records of patients who had surgery for colorectal cancer at the University College Hospital Ibadan, Nigeria, between 2002 and 2010 with particular attention to the ethnic groups to which they belonged.

Results

From 2002 to 2010, a total of 500 colorectal cancer cases were operated on at the UCH Ibadan, giving an annual rate of about 63 patients. Colon cancer cases were 244 (48.8%), rectosigmoid locations were 34(6.8%) and rectal cancer cases were 222(44.4%). Out of these patients, 73% were Yoruba (the dominant and indigenous ethnic group in Ibadan), 13.5% were Ibo, 12.9% were from Bendel, while Hausa, Cross-river and Rivers made up the remaining 1.5%, 1.8% and 0.5% respectively. (Figure 1)

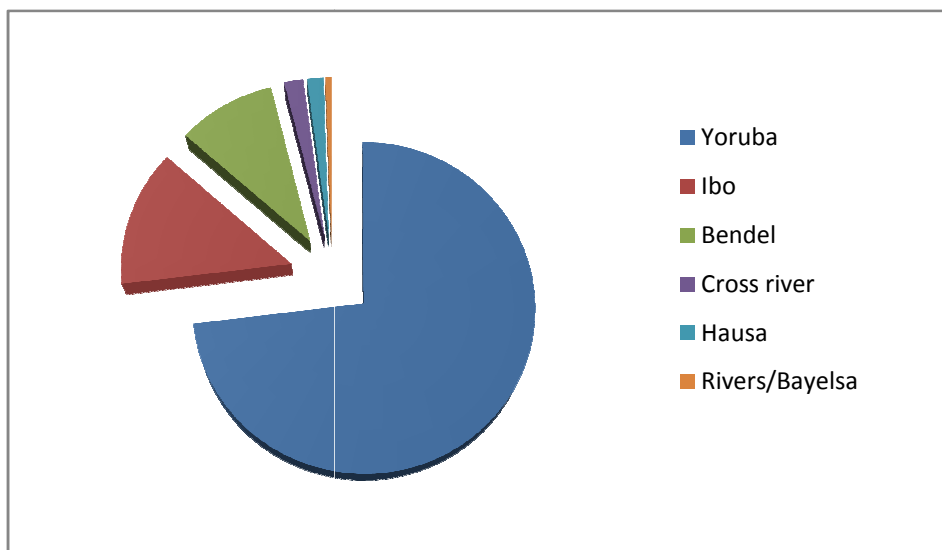


Figure 1.

Discussion

The University College Hospital (UCH) Ibadan which is located in the capital of the old western state of Nigeria, and which is also the first and largest teaching hospital in Nigeria, caters for the highest number of colorectal cancer cases seen in Nigeria. The old western state was the enclave of the Yoruba race; even though the state has been split into 5 different states, the UCH Ibadan still serves the core Yoruba states (Oyo, Ogun, Osun, Ekiti, Ondo) and all other states in Nigeria especially for the treatment of cancer cases in general. Ibadan which is a metropolis is also cosmopolitan as the different ethnic groups in Nigeria find easy abode there with freedom to express their culture and ethnicity. Thus the patients seen in Ibadan form a microcosm of the ethnic groups in Nigeria. Nigeria has over 10 ethnic groups with over 250 dialects and languages but the major ethnic groups are usually referred to as the big three i.e. the Hausa, Yoruba and the Igbo (Ibo). Other ethnic groups include the Tiv, Jukun, Fulani, Efik, Ibibio, Ijaw, Kalabari, Urhobo, Edo etc. Reports on CRC from teaching hospitals in these locations have consistently

shown a lower incidence as compared to the UCH Ibadan and this has stimulated curiosity in finding a plausible explanation.

Over the last 40 years reports from studies in Ibadan^{1,2} have shown that the incidence of CRC has been increasing steadily from about 18 -20 per year to current figures of over 60 patients per year. None of the earlier studies had stratified the incidence into ethnic groups. Looking at studies from other parts of the country involving major and other ethnic groups, the figures obtained show that figures from Jos (now part of middle belt of Nigeria but initially part of north) averaged 2 per year in one study³ and 22 cases per year in another study⁴. Sites from what is known as the core north (Hausa/Fulani) showed 12.5 cases per year in Kano⁵, 6 cases per year in Maiduguri⁶ and 5 cases annually in Sokoto⁷. In the riverine area of Nigeria, usually described as south-south, reports from Port Harcourt which is a major city, reveal rates of less than 2 patients per year in the most recent publication of CRC to emanate from there⁸ⁱ while a previous publication showed rates of less than 4 patients per year⁹.

Calabar which is home to both Efik and Ibibio, also in South-south, showed figures of about 5 cases of CRC per year¹⁰, indeed in the report from the Calabar cancer registry covering the period from 2004 to 2009, the top 7 cancers did not include CRC¹¹. The Igbo comprise the largest ethnic community in the former eastern Nigeria and a study of malignant disease of the colon, rectum and anus emanating from there showed a yearly return of 5 cases of CRC¹². A similar rate was observed in Benin City, the capital of Edo state, where 106 cases were encountered over a period of 20 years¹³. It is apparent that as one moves eastwards, southwards and northwards in Nigeria, the incidence of colorectal cancer diminishes with greater significance southwards (south-south). The culture, diet and terrain are drastically different. If one agrees that diet has been implicated as a major factor in colorectal carcinogenesis, then it behoves one to look closer at what is consumed in the riverine areas of Nigeria as these could well be cancer-preventive diets. Cassava bolus taken with spicy stews prepared with plenty of palm oil, green vegetables and fish are commonly ingested in this region. Documentation abounds on the chemo-preventive properties of these dietary constituents; Indeed a typical Nigerian diet has been found to be protective against colon cancer in experimental situation using Wistar rats¹⁴. Red chilli pepper is a constant spice used in all Nigerian diets; Capsaicin (Trans-8-Methyl-N-Vanilyl-6-Nonenamide) is the pungent ingredient found in red pepper and it represses the growth of malignant cell lines by its ability to induce apoptosis^{15,16}. Palm oil, green vegetables and fish have also been well-documented to have cancer-protective properties^{17,18,19}.

If, as been earlier established by migration studies that as one moves from an environment of low colorectal cancer incidence to one with a high incidence, he/she or their offspring are at a higher risk of developing the disease^{20,21}, then, conversely, it stands to reason that leaving such high-risk regions to those regions with very low risk of colorectal cancer will translate into reduced occurrence in those initially predisposed i.e. those with colonic polyps or ulcerative colitis. Now we have discovered that even in a region where colorectal cancer incidence is very low, there exists a microsystem within that system with even lower rates. This phenomenon of 'lower incidence within a milieu of low incidence of colorectal cancer' is reportable and should be shared so that more research is done in this area to benefit others (especially in developed nations).

I will conclude with the opening passages of an introduction of a previous publication of mine: 'The lower incidence of colon and rectal cancer in the native black African has continued to be a constant focus of research. Hopefully preventive factors may be discovered which may help to reduce the significant health burden of patients who develop colorectal cancer in the western world'¹. This paper may well produce the impetus to for a research project to closely study the living and eating habits of the people of the riverine areas of Nigeria with a view to colon cancer prevention.

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