GCC Cancer Treatment Protocol Guidelines for Breast and Colorectal Cancer

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Introduction

Modifiable risk factors including poor nutritional habits, physical inactivity, and smoking are known to be associated with 20% of annual mortality globally.\(^1\) Approximately 50% of all malignancies especially breast, colon, endometrium, stomach, prostate and kidneys are associated with these modifiable risk factors.\(^2,3\) Dietary habits, life style, smoking, drinking coffee and marital status may not only fuel a rise in various cancers, but may also affect the treatment outcomes especially survival.\(^4,5\)

Recent data has shown that lifestyle changes and pharmacologic interventions may reduce the risk of cancer.\(^6\) For example, maintenance of a healthy weight and adhering to fiber rich and low fat diet reduces the risk of breast cancer,\(^7\) and taking aspirin daily reduces the risk of colon cancer.\(^8\) Recently an interesting large prospective study found a small, though not significant reduction in risk of endometrial cancer with intentional weight loss of at least 20 pounds (relative risk (RR) =0.96; 95% confidence interval (CI) 0.61–1.52).\(^9\) Another prospective trial in ovarian cancer found risk reduction in ovarian cancer with a low-fat diet with a hazard ratio (HR) of 0.60 (95% CI: 0.38–0.96) at 8 years post–intervention.\(^10\) Similarly, in one Japanese trial involving 41,761 adults, green tea consumption was found to be associated with a reduced risk of liver cancer.\(^11\) Coffee is found rich source of various polyphenols containing antioxidant properties which may be beneficial against various malignancies, however results of various studies are controversial.\(^12\)
Dietary patterns and lifestyle features of cancer patients in Saudi Arabia are not well studied. A case-control study from neighborhood country, Jordan found that patients with colorectal cancers had lower dietary intake of fiber, folate, vitamin B12, \(\beta\)-carotene, vitamin C and selenium as compared to controls (\(P<0.05\)).¹³

We aimed to compare the dietary habits, engagement in various sports, smoking habits, marital status and other demographic characteristics, between cancer patients and healthy adults (control group) at our institute, Riyadh, Saudi Arabia.

**Patients and Methods**

A cross-sectional descriptive study based on interviews and clinical data information on 237 cancer patients and 263 normal subjects was carried out in Riyadh after the approval from institutional ethical Review Committee with a well-structured questionnaire which was distributed among these participants during their visits in hospitals, malls and awareness campaigns in 2011 to 2014. For participants with difficulty in reading the questionnaire, volunteers assisted in filling the questionnaire by taking their answers. Exclusion criteria was the people working in health industry (doctors, nurses, pharmacists, medical students). The questionnaire was written in Arabic language and had 25 structured questions which were divided mainly into three components, (a) demographic data (age, gender, height, eight, body mass index, marital status, employment status and type of malignancies in cancer patients) (8 items), (b) life style activities and dietary habits (11 items), and (c) additional questions (age at marriage, number of marriages, pregnancies, use of oral contraceptive pills and ovulation stimulating drugs) (6 items).

Estimated power of study was calculated using a confidence level of 95% and a 5% bound-on error and prevalence of breast cancer and other more prevalent malignancies (hematological, gastric, colon and thyroid).⁸,⁹ The required sample size came out to be 590. Assuming a refusal rate of 10%, 654 potential subjects were contacted and the target achieved was 500 participants.

**Statistical analysis:**

The data was analyzed using Statistical Product and Service Solutions (SPSS) version 20.0. Descriptive statistics (mean and standard deviations), and categorical data (frequencies and percentages) were computed. Mean and corresponding 95% confidence interval for continuous variables was calculated and analysis of variance (ANOVA) was used to confirm significance values. \(P\) value of <0.05 was taken to be statistically significant.

The Mantel–Haenszel method was applied to estimate Odds Ratio (OR) for study population.

**Results**

A total of 500 participants filled the questionnaire. Among those, 237 were cancer patients (47.4%). Mean age of whole cohort was 39.3 years (range: 14–85). Regarding the age, height, weight and body mass index. However, higher percentage of married (72.6% vs. 55.5%) and divorced (10.2% vs.4.2%) was noticed in cancer patients (\(P = 0.002\)). In cancer group of patients, majority were unemployed (employees = 24.5%; housewives = 49.3%; retired = 16.0%) as compared to controls (employees = 60.9%; housewives = 14.1%; retired = 2.0%) \(P = 0.0001\). Among the cancer group of patients, breast cancer was predominant (45.6%), followed by colon cancer (11.4%), leukemia (10.5%) and thyroid cancer (8.0%). Detailed demographic characteristics are shown in Table.1.

Regarding the lifestyle and dietary habits, no statistical difference was observed between two groups regarding

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cancer Patients ((n = 237))</th>
<th>Control group ((n = 263))</th>
<th>(P) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>39.8 (18-85)</td>
<td>38.7 (14-80)</td>
<td>0.67</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>176 (74.6)</td>
<td>222 (84.4)</td>
<td>0.04</td>
</tr>
<tr>
<td>Male</td>
<td>61 (25.7)</td>
<td>41 (15.6)</td>
<td></td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>27.6 (17-53)</td>
<td>25.3 (15-47)</td>
<td>0.54</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>172 (72.6)</td>
<td>146 (55.5)</td>
<td>0.002</td>
</tr>
<tr>
<td>Single</td>
<td>27 (11.4)</td>
<td>106 (40.3)</td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>24 (10.2)</td>
<td>11 (04.2)</td>
<td></td>
</tr>
<tr>
<td>Widow</td>
<td>14 (06.0)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
<td>0.0001</td>
</tr>
<tr>
<td>Employee</td>
<td>58 (24.5)</td>
<td>160 (60.9)</td>
<td></td>
</tr>
<tr>
<td>Jobless</td>
<td>17 (07.2)</td>
<td>51 (19.2)</td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>117 (49.3)</td>
<td>37 (14.1)</td>
<td></td>
</tr>
<tr>
<td>Housewives</td>
<td>38 (16.0)</td>
<td>5 (02.0)</td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Types of Cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast</td>
<td>108 (45.6)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Leukemia</td>
<td>25 (10.5)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Lymphoma</td>
<td>11 (04.0)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Colon</td>
<td>27 (11.4)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Gastric</td>
<td>12 (05.1)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Testicular</td>
<td>3 (01.3)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Thyroid</td>
<td>19 (08.0)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sarcoma</td>
<td>2 (08.4)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Brain</td>
<td>1 (04.2)</td>
<td>-</td>
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<tr>
<td>Prostate</td>
<td>5 (02.1)</td>
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<tr>
<td>Uterine</td>
<td>6 (02.5)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Kidney</td>
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<td>-</td>
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</tr>
<tr>
<td>Liver</td>
<td>7 (03.0)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ovary</td>
<td>10 (04.2)</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Table.1. Demographic and social characteristics of cohort
The playing sports, types of sports and sports hours ($P = 0.16$; $P = 0.96$; and $P = 0.21$ respectively). Similarly, no significant difference was noticed between two groups in terms of watching television and hours spent in front of television ($P = 0.95$). However, use of laptops, tablets and internet surfing was significantly higher in controls as compared to cancer patients ($80.3\%$ vs. $42.2\%$) $P = 0.0001$. Smoking habits between cancer patients and controls were different ($90.6\%$ vs. $66.4\%$) $P = 0.0001$, while in contrast, healthy controls reported more use of ovulation stimulating drugs ($20.6\%$ vs. $11.2\%$) $P = 0.01$. Details are shown in Table 3.

More cancer patients got married at early age between 11–20 years ($58.7\%$ vs. $37.7\%$) $P = 0.01$.

**Discussion**

Our study showed some interesting findings. Firstly, majority of cancer patients were found to have low socio-economic status (unemployed and retired), which is consistent with findings of other epidemiological studies. (14) However, in contrast to other studies, protective effect of marriage against cancer risk which is likely related to spousal support was not observed in our study.(15,16) Exact explanation could not be explained, but it is likely associated with low socio-economic status and selection bias as majority of cancer cohort was with breast cancer.

Secondly, non-significant difference was observed between cancer patients and controls regarding the playing sports, types of sports and sports hours, which can be explained by heterogeneity of our cohort. Current evidence of lack of physical activity in malignancies especially breast cancer is controversial, though physical activity appear promising, but further studies are warranted to establish their efficacy.(17)
Thirdly, use of laptops, tablets and internet surfing were found significantly less in cancer patients, which reflected the educational background of cancer patients and lack of nutritional and lifestyle knowledge. Various studies have shown that internet access and availability of online information is associated with dietary and lifestyle changes, thus cancer prevention.\(^{(18)}\)

Fourthly, related to smoking, although non-significant difference was observed between cancer patients and controls, cancer patients started smoking at very young and were relatively heavy smokers, which is in agreement with reported data.\(^{(19)}\) Similarly, consumption of coffee > 3 cups per day was significantly higher in cancer patients as compared to controls. This could be due to our heterogeneous population, but evidence is controversial, as many of studies have found a protective effect of high coffee consumption with respect to malignancies especially colon cancer, others have found either no effect or a rise in risk of cancer.\(^{(20, 21)}\)

Fifthly, it was seen that majority of cancer patients got married at early age between 11–20 years as compared to their counterpart, which can be explained by the religious and cultural traditions in country.\(^{(22)}\)

Sixthly, regarding the use of OCP, cancer patients reported more use these pills as compared to controls, which is also in agreement with other studies.\(^{(23)}\) Possible explanation could be our breast cancer predominant cohort. Lastly, no strong correlation between the use of ovarian stimulating drugs and cancer risk was seen, which was also in agreement with reported data;\(^{(24)}\) however, this needs further investigation.

Strengths of present study were (a) large sample size, (b) case–control study, (c) a well–structured questionnaire in Arabic version and limitations of study were (a) heterogeneous cancer patients and (b) lack of analysis regarding impact of these modifiable risk factors on treatment outcomes.

In conclusion, there is very scanty data regarding the impact of dietary habits, lifestyle, marital status and risk of cancer in Saudi Arabia. Results of present study showed that unemployment, low socioeconomic status, marital status (married, divorced and young age at marriage), lack of nutritional knowledge through internet, heavy smoking, and heavy coffee consumption were associated with the risk of various cancers in our population. However, further similar studies are warranted.

References


