ASSESSMENT OF AWARENESS TOWARDS SOME CARCINOGENS IN HAIL REGION, SAUDIA ARABIA

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INTRODUCTION

It is generally known that cancer and carcinogenesis are the major challenges facing global medicinal chemistry [1], mainly in the part of preventive toxicology [2,3] as it assumes an idealized toxicity against organisms and acts through a subtle, undiscovered molecular mechanism. The basic mechanism in cancer cell proliferation is through a variety of compounds, making it difficult to assess specific ligand-receptor interaction patterns [4,5].

Pesticides are agents designed to kill insects, weeds, fungi, rodents, and other unwanted plants and plant life. Many are carcinogenic in animal bioassays and some are known or suspected to be human carcinogens [6]. The International Agency for Research on Cancer (IARC) had classified 26 pesticides as having sufficient evidence of carcinogenicity in animals and 19 as having limited evidence in animals [7,8].

The epidemiological evidence on the association between tobacco smoking and cancer was well established. Studies published since the 1986 IARC Monograph on "Tobacco smoking" provide sufficient evidence to establish a causal association between cigarette smoking and cancer of the nasal cavities and paranasal sinuses, nasopharynx, stomach, liver, kidney (renal cell carcinoma) and uterine cervix, and for adenocarcinoma of the oesophagus and myeloid leukaemia. These sites add to the previously established list of cancers causally associated with cigarette smoking, namely cancer of the lung, oral cavity, pharynx, larynx, oesophagus, pancreas, urinary bladder and renal pelvis. It has been estimated that every other smoker will be killed by tobacco [9].

Alcohol consumption has been associated with a variety of different forms of cancer in man for several centuries. The evidence linking alcohol drinking to cancer risk has been reported in several studies [11,12,13]. There is convincing epidemiological evidence that the consumption of alcoholic beverages increases the risk of cancers of the oral cavity, the pharynx and the larynx, and the risk of squamous cell carcinoma of the oesophagus [14].

OBJECTIVE: The objective of this study was to assess the knowledge toward the use of some common chemical among Hail region population.

METHODOLOGY: This is a cross-sectional survey in which data was collected from an area inhabited with 120,000 individuals. Of the 600 asked to participate, only 475/600 (79.2%) subjects have completed the standard form.

RESULTS: Of the 475 (79.2%), who responded to the question, whether they are currently smokers or alcohol consumers, 167/475 (35.2%) or 46/475 (9.7%) respectively, answered yes. Also 68/475 (14.2%) are used to eat fresh vegetable without washing. Regarding exposure to insecticides and other chemicals, 116/475 (24.4%) and 245/475 (51.6%), were found with continuous exposure, in this order.

CONCLUSION: The present study strongly hit the urgent need for cancer awareness programs and prevention strategies to reduce the exposure to carcinogenic chemicals.

Keywords: carcinogenic chemicals, Smokers, alcoholic consumers, cancer awareness, Hail.

MATERIALS AND METHODS

This is a community-based, cross-sectional study was conducted in Hail city in Saudi Arabia (KSA), during the period from May to July 2012. Data was collected as a part of cancer awareness campaign that covered an area inhabited with 120,000 individuals. People were gathered in certain centers (Schools, Clubs Health centres), then were asked to fill the questionnaire about occupational exposure to some chemicals (including: Tobacco use, Alcohol consumption, Insecticides exposure,
Plasticizers exposure, Chemical usage and preserved food), and other information regarding their attitudes towards these factors.

**Statistical Analysis**

Statistical analysis was performed by proportion. The Microsoft Excel Office 2007 and the SPSS software (version 16) were used for statistical analysis.

**Ethical Consent**

Written informed consent was obtained from each respondent, ensuring strict anonymity. The Ethical Committee of the Department of Histopathology and Cytology, FMLS, University of Khartoum has approved the study.

**RESULTS**

Of the 464 (97.7 %), who responded to the question, whether they have a continuous contact with insecticides, 105/464 (22.1%) answered yes. Also 66/472 (13.9%) have declared that they use to eat fresh vegetable in the farm without washing. Of the 472 respondents regarding tobacco and alcohol habits, 164 (34.5%) and 35 (7.5%), of tobacco smokers and alcoholic beverage users respectively, have used or currently using these products (Table 1).

On asking the participants whether they have relatives with cancer, 185/475 (38.9%) have stated that they have relatives with cancers. Of the 185 subjects having relatives with cancer, 21.7 % have only one relative with cancer, 10.9 % have two relative with cancers, 1.5 % have four relatives and 0.4% has six relatives with cancers. The most declared cancers were lung 5.9 %, Leukemia 5.7%, Breast 3.2%, Oral 2.3%, Prostate 2.1%, stomach 4%, Cervix 1.5%, colon 2.9% and others 5.9%, as indicated in Figure1.

On asking the study subjects, about whether chemical carcinogens can cause cancer, (5.7% and 13.3%), (32% and 13.1%), (35.8% and 13.1%), (38.1% and 13.1%), (53.9% and 13.1%), (58.3% and 13.1%), (52.2% and 13.1%) and 70.1% and 13.1%), (75.8% and 13.1%), (76.4% and 13.1%) and (32.6% and 13.1%) of Tobacco smoking, Alcohol consumption, Insecticides exposure, Plasticizers, preserved food, genetics, viruses, Bacteria, Parasites, Fungi and radiation respectively, answered (No and No Answer), per capita, as shown in Table2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes %</th>
<th>No %</th>
<th>No Answer %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>80.8 %</td>
<td>5.7 %</td>
<td>13.3 %</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>54.9 %</td>
<td>32 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>Insecticides exposure</td>
<td>50.9 %</td>
<td>35.8 %</td>
<td>13.1 %</td>
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<tr>
<td>Plasticizers</td>
<td>48.8 %</td>
<td>38.1 %</td>
<td>13.1 %</td>
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<tr>
<td>preserved food</td>
<td>33.1 %</td>
<td>53.9 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>genetics</td>
<td>26.6 %</td>
<td>58.3 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>viruses</td>
<td>34.7 %</td>
<td>52.2 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>Bacteria</td>
<td>16.8 %</td>
<td>70.1 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>Fungi</td>
<td>11.2 %</td>
<td>75.8 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>radiation</td>
<td>54.1 %</td>
<td>32.6 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>No physical activities</td>
<td>13.7 %</td>
<td>73.3 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>Soft food</td>
<td>29.7 %</td>
<td>57.3 %</td>
<td>13.1 %</td>
</tr>
<tr>
<td>obesity</td>
<td>17.7 %</td>
<td>69.1 %</td>
<td>13.1 %</td>
</tr>
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</table>
DISCUSSION

Measuring cancer awareness is important; as it gives the policy makers and health care givers an opportunity to understand the impact of the interventions and do what is possible to get the desired outcomes. Promotion of cancer awareness has potential impacts on cancer control. Knowledge of potential carcinogenic may assist in reducing or prevention of exposure. However, this study evaluated exposure, knowledge and attitude towards certain chemicals that are widely used in the Hail city in Saudi Arabia. Pesticides are widely used in agricultural and other settings, resulting in continuing human exposure. Epidemiologic studies indicate that, in progress exposures are associated with risks to human health [21]. In this there is a slightly increase in pesticides direct exposure (22.1%). Also many people use to eat vegetables and other agricultural products without washing (13.9%) which in most instances containing pesticides and other chemical additives. On asking these people, whether these pesticides have a link with cancer, 35.8% answered no and 13.1% have no answered. Epidemiologic evidence on the relationship between chemical pesticides and cancer is established. In animal studies, many pesticides are carcinogenic, (e.g., organochlorines, creosote, and sulfalate) while others (notably, the organochlorines DDT, chlordane, and lindane) are tumor promoters. In humans, arsenic compounds and insecticides used occupationally have been classified as carcinogens by the IARC on Cancer. Human data, however, are limited by the small number of studies that evaluate individual pesticides. Epidemiologic studies, although sometimes contradictory, have linked phenoxy acid herbicides or contaminants in them with soft tissue sarcoma (STS) and malignant lymphoma; organochlorine insecticides are linked with STS, non-Hodgkin's lymphoma (NHL), leukemia, and, less consistently, with cancers of the lung and breast; organophosphorous compounds are linked with NHL and leukemia; and triazine herbicides with ovarian cancer [22]. The proportions of tobacco and Pesticides users are relatively higher in the studied sample. The great majority were smokers 34.5% and Pesticides 22.1%. On measuring their attitude and knowledge about these chemicals, many people ignore the risk of these products. However, 5.7%, 32% and 35.8% of smokers, Alcohol and Pesticides use ignore the relationship between cancer and these products. Currently, tobacco smoking causes approximately 5-6 million deaths per year including more than 35% of all cancer deaths. Nicotine, the addictive constituent of tobacco, and its derived carcinogenic nitrosamines, contribute to cancer promotion and progression through the activation of nicotinic acetylcholine receptors (nAChR).

Nicotine induces DNA damages, via induction of oxidative stress, in bronchial epithelial cells [23]. Although, the knowledge of people about the risk of cancer is relatively higher, but many people still using it. The present data points to the urgent need for educational programs and preventive measures against the use of smoking and Pesticides use.

Plasticizers are commonly used in KSA, and mostly as food containers. Plastic containers are frequently used for handling hot and cold food and drinks, such as, boiled milk or some common tradition food (Fool), as well as used for storing frozen food. In this study, 38.1% of the study subjects ignore the health effects of these materials. Butyl benzyl phthalate (BBP) is a plasticizer commonly used in pipes, vinyl floor tiles, vinyl foams, and carpet backing, and to a minor extent, in cellulose plastics and polyurethane 9. This compound has shown to be weakly estrogenic [26] and to induce adverse effects on the development of male reproductive system; thus acting as an endocrine disruptor. BBP has shown endocrine-disrupting properties, thus having a potential effect on hormone sensitive tissues [27]. However, some studies have reported the link between exposure to Plasticizers and risk of cancer particularly, breast and testicular cancers (28,29,27).

The association between cancer and exposure to ionizing radiation has been well documented [30]. Evidence for this association is derived mainly from data on atomic bomb survivors and from patients who, a few decades ago, received high doses of therapeutic radiation for diseases other than cancer. Associations between ionizing radiation and specific types of cancer, particularly leukemia, have also been well established [31].

Conclusion: The data at hand point to the urgent need for educational programs and preventive measures against the exposure to carcinogenic chemicals. The need for in depth epidemiological studies and further specific measurements to prove that exposure to these risk factors have impact on cancer burden in Hail region in KSA is urgently needed.

References continues on the next page

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