

Prevalence of Malignancies in relation with Stress in the Population State of Sindh (Pakistan)

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Abstract: Objective: To study the relationship of stress with cancers and its prevalence in the population of Sindh (Pakistan). **Methodology:** This study employed a Questionnaire-based interview of 90 cancer patients. The survey was conducted from Aug 2013 to Feb 2014 at two centers of Jamshoro Sindh, Pakistan namely NIMRA (Nuclear institute of Medical Radiotherapy) and LUH (Liaquat University Hospital). Informed consent was obtained and permission from NIMRA was taken. Holmes-Rahe Inventory was used to calculate stress and data was analyzed by SPSS (Statistical package for the social sciences) version 16. **Result:** Thirty three percent patients reported no significant stressful event in their past 2 years i.e. 2013, 2012 but 67% patients had faced stressful events which lead to the development of chronic stress. Among the patients with history of stress, 40% patients had stress scores between 150-300 showing that they might develop some major illness in forthcoming years and 50% patients having scores between 0-150 indicating that they have a low susceptibility to stress-induced health breakdown. The commonest cancers found in the population of Sindh (Pakistan) found are the breast cancer (28%), buccal cancer (11%), ovarian cancer (7%), neck cancer (6%) and colon cancer (4%). The most distressing events in one's life found were financial crash (37%), death of any family member (23%) and behavior change of family member (20%).

Conclusion: Stress indirectly contributes to the development of cancer.

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Keywords: Life change events; neoplasms; immunosuppression.

Introduction

Stress is a set of events occurring in one's body due to any distressing stimulus which lead to the activation of his autonomic system^[1] hence, every adverse happening and mishap taking place in an individual's life has some kind of influence on physical and mental state making them prone to certain illness^[2]. Almost 10 million cancer cases are reported all over world yearly among which 5.5 million are from less developed countries and 4.7 million in developed countries^[4]. It is found that cancer has become the second most frequent cause of death in developed countries among all age groups^[3]. It is estimated that worldwide, about 6 million deaths occur due to cancers and if cancer remains uncontrolled the reported cases will increase to 15 million by 2020 with mortality around 10 million each year^[4]. The most commonly found malignancy among males is lung cancer followed by oral cavity and larynx cancer. Females are prone to develop breast cancer responsible for one third female cancers, followed by oral cavity and ovarian cancer^[5]. The greatest incidence of breast cancer reported for any Asian population is in Karachi^[5]. Several case control studies have evidence suggesting association between stress and the progression of breast cancer among women who have dealt with at

least any single distressing experience^[6]. Multiple stressful events in one's life are considered to be risk factors for several diseases such as, cardiovascular system disorders, asthma, arthritis and cancer^[2]. There are two types of onsets of stress, acute and chronic stress. Acute stress act as therapeutic factor in the suppression of tumor promoting agents by activation of one's immune system but chronic stress mainly act as immunosuppressant, therefore it aids in the progression of cancer^[7].

Cancer incidence data and surveys are not adequately found in Pakistan^[5] and also only sparse data is reported presenting relationship of stress with malignancies^[7]. Therefore, this study was designed to determine whether stressful events have any impact on the predisposition for cancers and to find stressors among this population.

Methodology

A) Study design and period: This observational study employed a questionnaire based interview. The survey was conducted from August 2013 to February 2014.

B) Sample size: The sample size calculated for this study was of 90 and hence 33 males and 57 females were approached.

C) Study area and population: The survey was conducted at Jamshoro (Sindh, Pakistan) from where cancer patients of two centers namely NIMRA (Nuclear institute of Medical Radiotherapy) and LUH (Liaquat University Hospital) were assessed. The data collection was permitted by the authority of NIMRA. The out-door patients were approached and were informed of the details of the present study; consent of the patients was obtained by way of filling and signing of a consent form.

D) Assessment of Life events: Holmes and Rahe stress inventory [14] was used to correlate the major life changes or stressful events in one's life during last 2 years. Each patient was asked to rate 43 events that altered their life in any way. Those events were particularly emphasized which lead to the patient's suffering from prolonged stress. To calculate score of the life event change as per Holmes and Rahe stress inventory (interpretations of these scores are shown in Table 1), individual scores were added of all the events and data was analyzed on SPSS version 16.

Result:

According to this study, 33% patients experienced no significant adverse events in the last 2 years i.e. 2013 and 2012, but 67% patients had faced several distressing experiences which lead to development of persistent stress. Out of 67%, 40% patients had scores falling in 150-300 and 50% patients having scores between 0-150 as mentioned in Table 2, among the latter category, 53% patients scored between 100-150 and 47% had stress level below 100. Interpretations of these ranges are shown in Table 1. Ten percent patients had stresses with causes which are found in our population such as daughter's married life difficulties, political issues, terrorism, street crimes etc but are not mentioned in Holmes and Rahe inventory which lead to the limitations of this study. The most common cancers found are breast cancer (28%), buccal cancer (11%), ovarian cancer (7%), neck cancer (6%) and colon cancer (4%) in our studied population. Thirty seven percent people reported facing financial problems heading number one of all the causes of stress found in this study. This was followed by 23% having stress due to death of any family member or a loved one and 20% patients reporting behavioral or health-wise change of any family member.

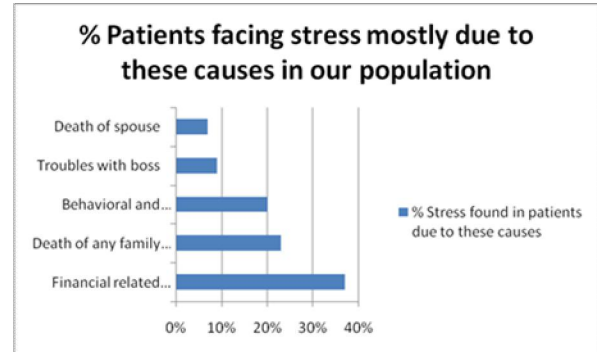
Table No: 01

Stress Score of Studied population according to Holmes Rahi Inventory

Stress scores	Percentage of people
150 or < points	50%
150-300 points	40%
300 or > points	0%

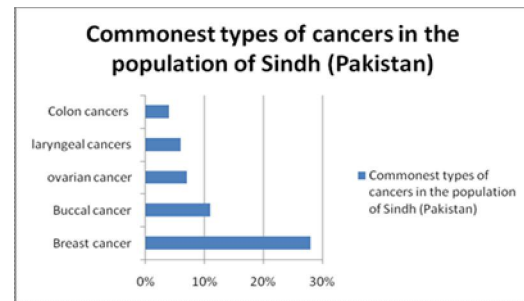
Discussion

Graph No: 01



Causes of Stress found in studied population

Graph No: 02



Types of cancer in the population of Sindh (Pakistan)

According to this study, almost 67% cancer patients had encountered some kinds of stress causing events in their last 2 years. Among the causes of stress mentioned in Holmes and Rahe Inventory, the financial crisis and deaths of close one's were the leading causes. However, there were some distressing events which were found in our population but were not mentioned in the inventory like daughter's married life difficulties, political issues, terrorism, street crimes etc, which limited this study and some causes from the inventory were not frequently related to stress for this population as vacations, family gatherings and sleeping habits. Chronic stress means the stress remains for a longer time such as days, weeks and even years and deactivate the immune system [8][9] such as depression of cell-mediated immunity [1]. The homeostasis of body is determined by the glucocorticoid level in circulation which binds to mineralocorticoid and glucocorticoid receptors decreasing and controlling the hormonal levels of hypothalamic-pituitary-adrenal hormones which in turn decreases the predisposition of diseases arising

from mental stress^[10]. Psychological stress disturbs the normal balance of internal body predisposing one to certain illness^[10]. Acute stress activates certain aspects of innate immunity yet suppresses some specific immunity but chronic stress leads to depression of both cellular and humoral aspects of immunity^[11] and it also limits leukocyte proliferative property and its movement^[12]. Chronic stress is also responsible for decreased activity of natural killer cell cytotoxicity^[11]. Suppression of natural killer cells and cytotoxic T-cell leads to alterations of multiple processes such as immunological surveillance of tumors and the phenomenon of production and collections of somatic cells instability and genetic alterations^[13]. This type of suppression in immune system leads to more infectious and malignant diseases in patients with chronic stress^[11]. Therefore, in order to acknowledge the association between neuroendocrine system and its effect on immune system, detailed histopathological study should be done for the development of better clinical and therapeutic strategies^[13].

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