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Research Article

ANALYSIS OF LEVEL OF ANTIOXIDANTS IN CERVICAL CANCER PATIENTS IN PAKISTAN

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Abstract:

Introduction: Cervical cancer is the second most common cancer in women, and the seventh overall. Risk factors for cervical cancer include: early age at first sexual intercourse, number of sexual partners, malnutrition, smoking and longtime use of oral contraceptives.

Objectives of the study: This study is aimed to analyze lipid peroxidation status in cervical cancer female patients after receiving chemotherapy.

Methodology of the study: This cross-sectional study was conducted in Health department Punjab. The data was collected from 100 cervical cancer patients. The data was collected through non probability sampling technique. 5.0 ml blood sample was taken from vein. Blood was further processed for the estimation of lipid peroxidation. Commercially available enzymatic kits of Randox were used. Blood was centrifuged at 4000 rpm for 10 minutes and serum was separated.

Results: The data was collected from 50 patients. The statistical analysis shows that levels of antioxidants become increasing in prostate cancer patients who received adjuvant radiotherapy or simple radiotherapy. The level of antioxidants before radiotherapy is 3.48 ± 0.65 and it become increases in post radiotherapy. As the value of antioxidants post radiotherapy is 5.66 ± 0.95 . But in case of adjuvant radiotherapy it becomes 3.27 ± 0.16 (pre-treatment) and 6.79 ± 0.40 (post-treatment). The levels of antioxidants become increased because cell membrane is damaged due to therapies.

Conclusion: It is concluded that antioxidants is one of the important markers of body for protecting the body against the diverse effects of radiotherapy.

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INTRODUCTION:

Cervical cancer is the second most common cancer in women, and the seventh overall. Risk factors for cervical cancer include: early age at first sexual intercourse, number of sexual partners, malnutrition, smoking, long time use of oral contraceptives and, most importantly, Human Papilloma Virus infection [1]. Recent data revealed the role of oxidative stress in cervical cancer. The development of cervical cancer at first begins with precancerous lesions, either low squamous intraepithelial lesions (L-SIL) or the more advanced high squamous intraepithelial lesion (H-SIL). These lesions can develop further into a neoplasia [2].

Reactive oxygen species (ROS) tend to pair with adjacent molecules, which can be lipids, proteins and DNA. On the other hand, antioxidants serve as scavengers of ROS. In a healthy system, ROS and antioxidants are in a state of balance [3]. However, when the quantity of ROS exceeds that of antioxidants, the system enters a state of oxidative stress. Antioxidative enzymes, such as superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), glutathione reductase (GR) and glutathione-S-transferase (GST), maintain redox balance. Their activity can be used to estimate the oxidative defense mechanism strength [4]. Antioxidative enzymes inhibit both the initiation and promotion of carcinogenesis. Cervical cancer is the most prevalent genital tract cancer in the world, including India. It is a multifactorial disease process and several risk factors include, early age intercourse, multiple sex partners, low socioeconomic status, and Human papillomavirus (HPV) infection. Chronic inflammation and infection over a prolonged period of time have been recognized as major risk factor for disease initiation [5].

Carcinoma in situ is but a phase leading to frank cancer. Evidence has indicated that reactive oxygen species (ROS) are involved in the initiation and progression of carcinogenesis [6]. This may be due to the damage caused to the tumor suppressor genes or immunological defenses in our body. Superoxide and hydroxyl radicals are oxygen-free radicals, involved in producing oxidative stress. This oxidative stress can

be associated with other factors which may lead to various neoplastic transformations [7].

OBJECTIVES OF THE STUDY:

This study is aim to analyze lipid peroxidation status in cervical cancer female patients after receiving chemotherapy.

METHODOLOGY OF THE STUDY:

This cross-sectional study was conducted in Health department Punjab. The data was collected from 100 cervical cancer patients. The data was collected through non probability sampling technique. 5.0 ml blood sample was taken from vein. Blood was further processed for the estimation of lipid peroxidation. Commercially available enzymatic kits of Randox were used. Blood was centrifuged at 4000 rpm for 10 minutes and serum was separated. Blood samples will be collected into EDTA tubes from fasting proteins. The blood will be centrifuged and indomethacin and butylated hydroxytoluene will be added into the plasma samples before they will be stored at -80°C until analysis.

STATISTICAL ANALYSIS:

Student's t-test was performed to evaluate the differences in roughness between group P and S. Two-way ANOVA was performed to study the contributions. A chi-square test was used to examine the difference in the distribution of the fracture modes (SPSS 19.0 for Windows, SPSS Inc., USA).

RESULTS:

The data was collected from 100 patients. The statistical analysis shows that levels of antioxidants become increasing in prostate cancer patients who received adjuvant radiotherapy or simple radiotherapy. The level of antioxidants before radiotherapy is 3.48 ± 0.65 and it become increases in post radiotherapy. As the value of antioxidants post radiotherapy is 5.66 ± 0.95 . But in case of adjuvant radiotherapy it becomes 3.27 ± 0.16 (pre-treatment) and 6.79 ± 0.40 (post-treatment). The levels of antioxidants become increased because cell membrane is damaged due to therapies.

Table 01: Antioxidants levels in cervical cancer patients

Cervical cancer	CONTROL	ANTIOXIDANTS (moles/ml)			
		Females (n=100)		Males (n=00)	
		BEFORE	AFTER	BEFORE	AFTER
	2.35moles/ml				
R1	0	3.5±0.74	5.22±0.85	0	0
R2	0	3.6±0.82	5.42±0.80	0	0
R1+C	0	0.00±0.00	0.00±0.00	0	0
R2+C	0	3.27±0.16	6.79±0.40	0	0
C	0	0.00±0.00	0.00±0.00	0	0
Total	2.35	3.48±0.65	5.66±0.95	0	0

Means±SD**R1**=Received Radio Therapy Single Time**R2**=Received Radio Therapy Two Times**R1+C**=Received Radio Therapy Single Time + Chemotherapy**R2**=Received Radio Therapy Two Times + Chemotherapy**C**=Only Received Chemotherapy**DISCUSSION:**

Cancer therapy, such as chemotherapy, can result in the generation of excess ROS/RNS. Thus cancer therapy and the resulting production of excess oxidative stress can damage biological systems other than tumors. Thus, in the present study we have demonstrated the status of lipid peroxides and antioxidants in plasma and erythrocytes of prostate cancer patients in comparison with normal subjects [6]. During chemotherapy the highest known levels of oxidative stress are generated by anthracycline antibiotics, followed in no particular order by alkylating agents, platinum-coordination complexes, epipodophyllotoxins, and camptothecins. The primary site of ROS/RNS generation during cancer chemotherapy is the cytochrome P450 monooxygenase system within liver microsomes [8]. Enzyme systems, such as the xanthine-xanthine oxidase system, and non-enzymatic mechanisms also play a role in creating excess oxidative stress during chemotherapy.

Chemotherapeutic agents used to treat cancer cause oxidative stress, which produces side effects, and among the most common side effects is chronic fatigue. Chronic fatigue caused by cancer therapy can reduce therapeutic efficacy [7]. They must also have intact apoptotic pathways. Thus oxidative stress interferes with cell cycle progression by inhibiting the transition of cells from the G0 to G1 phase, slowing progression through S phase by inhibition of DNA synthesis. This results in inhibition of cell cycle progression of the G1 to S phase, and it also results in inhibition by checkpoint arrest [9].

Lipid Peroxidation is the oxidative conversion of polyunsaturated fatty acids to antioxidants

(malondialdehyde); which is cytotoxic and acts as a tumor promoter and a co-carcinogenic agent. Damage caused by LPO impairs the functioning of the biological membrane and the continued damage leads to loss of membrane integrity [10].

CONCLUSION:

It is concluded that Antioxidants is one of the important marker of body for protecting the body against the diverse effects of radiotherapy. Although many anti-neoplastic agents have clearly established mechanisms of action that are not dependent upon the generation of ROS/RNS, these drugs can only mediate their anticancer effects on cancer cells that are exhibiting unrestricted progression through the cell cycle.

REFERENCES:

1. Panieri, E, Gogvadze, V, Norberg, E, Venkatesh, R, Orrenius, S, Zhivotovsky, B. Reactive oxygen species generated in different compartments induce cell death, survival, or senescence. *Free Radic Biol Med.* 2013;57:176-187
2. Sena, LA, Chandel, NS. Physiological roles of mitochondrial reactive oxygen species. *Mol Cell.* 2012;48:158-167
3. Bernardes, SS, de Souza-Neto, FP, Ramalho, LN. Systemic oxidative profile after tumor removal and the tumor microenvironment in melanoma patients. *Cancer Lett.* 2015;361:226-232
4. Vences-Catalán, F, Rajapaksa, R, Srivastava, MK. Tetraspanin CD81 promotes tumor growth and metastasis by modulating the functions of T regulatory and myeloid-derived suppressor cells. *Cancer Res.* 2015;75:4517-4526.

5. Jones, LM, Broz, ML, Ranger, JJ. STAT3 establishes an immunosuppressive microenvironment during the early stages of breast carcinogenesis to promote tumor growth and metastasis. *Cancer Res.* 2016;76:1416-1428.
6. Koebel, CM, Vermi, W, Swann, JB. Adaptive immunity maintains occult cancer in an equilibrium state. *Nature.* 2007;450:903-907.
7. Lee-Chang, C, Bodogai, M, Martin-Montalvo, A. Inhibition of breast cancer metastasis by resveratrol-mediated inactivation of tumor-evoked regulatory B cells. *J Immunol.* 2013;191:4141-4151.
8. Hiten RH Patel. (2014) Foreword. *Expert Review of Anticancer Therapy* 14:11, pages 1251-1252.
9. Ford ME, Vernon SW, Havstad SL, Thomas SA, Davis SD. Factors influencing behavioral intention regarding prostate cancer screening among older African-American men. *J Natl Med Assoc.* 2006;98(4):505–14. pmid:16623062; PubMed Central PMCID: PMC2569259.
10. Dube CE, Fuller BK, Rosen RK, Fagan M, O'Donnell J. Men's experiences of physical exams and cancer screening tests: a qualitative study. *Preventive medicine.* 2005;40(6):628–35. pmid:15850858
11. Halliwell, B. Reactive oxygen species in living systems: source, biochemistry, and role in human disease. *Am J Med.* 1991;91(3C):14S-22S.