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Research Article

**EVALUATION OF LIPID PEROXIDATION AND BIOCHEMICAL  
RESPONSE IN OVARIAN CANCER PATIENTS: A PERSPECTIVE  
STUDY FROM LOCAL POPULATION OF LAHORE-PAKISTAN**

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**Abstract:**

**Background:** Ovarian cancer refers to the growth of any cancerous cells in the ovaries. Most often ovarian cancer arises from the epithelium (outer lining) of the ovary. Ovarian cancer considered as the major reason of death in gynecological malignancies. The ovaries are two small organs located on either side of the uterus in a woman's body.

**Methodology:** 5.0 ml blood sample of 50 ovarian cancer patients and 50 healthy persons was collected in EDTA vials from oncology department of Mayo and Jinnah Hospital Lahore. MDA, CAT, GSH, SOD, Micronutrients, serum Electrolytes were estimated **Results:** Serum MDA level in ovarian malignancy patients is remarkably inflated ( $8.42 \pm 0.53$ ) whereas there level in healthy individuals was extremely low ( $2.25 \pm .24$ ). In patients the level of GSH reduced ( $0.12 \pm 0.14$ ) as compared to normal individual ( $6.35 \pm 0.17$ ). The CAT level is moderately decreased in patients ( $0.60 \pm 0.52$ ) as compared to healthy individual is high ( $4.16 \pm 1.06$ ). Ovarian cancer patients have remarkably deficient vitamin A level ( $2.55 \pm 0.17$ ) while its level was extremely high in healthy subjects ( $7.15 \pm 0.47$ ). So it depicts that ovarian cancer patients shows the highly significant behavior ( $p=0.000$ ). **Conclusion:** A fine balance between oxidants (ROS production) and antioxidants is predominant for the general defensive capacity of cells in contrast to oxidative damage. MDA level in ovarian malignancy patients is remarkably inflated due to high lipid peroxidation mechanism.

**Key Words:** SOD, MDA, GSH, CAT, Ovarian Cancer'

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**INTRODUCTION:**

Ovarian tumor rests the main origin of death from gynecological distortion. (1) Due to a scarcity of adequate transmission tactics, most women existing at a progressive stage related by deprived persistence, and hence preventive programs are urgent requirement to mitigate morbidity. A number of studies have been established a relationship among fatness and hormone dependent tumors involving endometrial melanoma and postmenopausal breast malignancy (2) but their association is ambiguous (3). The pervasiveness of cumbersome and obesity is increasing dangerously in greatest fragments of the biosphere, which is usually higher in women than in men. Environmental factors may play a significant role in ovarian malignancies, although clear relations with industrial exposure to carcinogens or to diagnostic and therapeutic radiation have not been established. Endocrine factors show anticipation in the progression of ovarian cancer. Women may choose to refrain from having children or stay nulliparous because of either male or female infertility.

Most common symptoms of Ovarian cancer includes bloating, fullness, and pressure in the abdomen with pain and fatigue also important, observed by urination and constipation problems (4, 5, 6). Normally ovaries are grow and differentiated by the basic regulator like estrogen and Cancer of the ovary progressed by it. It also affects and shows a principal role in the development of cancer in ovaries. Similarly, a noticeable proliferative response exhibited by cells of epithelium in ovarian surface. 90 percent malignancies are represented in those women's who are involved in postmenopausal period (7, 8).

Cancer initiating cells are reflection to establish the minute group of cells within a cancer that both commence the crucial syndrome and its repetition for their scope for itself-improvement and innate chemo resistance. Cancer stem cells have been recognize in a growing number of hematopoietic and solid tissue hostilities and are normally identified by advantage of the appearance of cell surface markers. The latter point of view to design the association of tumor markers such as CA125 with HE<sub>4</sub>. HE<sub>4</sub> is a glycoprotein in nature and is secreted by Mullerian epithelia which is the part of the female reproductive tract as well as male epididymis.

Oxidative stress is the state of a cell, which is described by the production of reactive oxygen species (ROS) which reduced the antioxidant protection. Mostly cancers are correlated with the organ, tissue or

cells which have decreased antioxidant status and elevated level is generated by the result of Oxidative stress. If ovarian cancer identified before time Life assurance and the aspects of life could be amplified. No doubt, modern methods of screening are able to recognize some such tumors, but they also catch both incurable and nonfatal tumors, as well as leaving an unfamiliar number of unidentified tumors. The chances of the development of ovarian cancer are double in those women who have never child and have significant effect for those women who experience infertility due the effect of nulliparity (9).

**MATERIAL AND METHODS:**

The whole experimental work was done in Biochemistry Lab, School of Biochemistry and Medical Lab Technology after the approval of ethical and Research committee, Minhaj University Lahore.

**Blood/Data Collection**

5.0 ml blood sample of 50 ovarian cancer patients and 50 healthy persons was collected in EDTA vials from oncology department of Mayo and Jinnah Hospital Lahore-Pakistan. Blood sample was centrifuged at 4000 rpm for 10 minutes and serum was separated. Serum sample was further processed for the estimation of Reduce Glutathione, Catalase, Superoxide Dismutase, Malondialdehyde, Nitric oxide, micronutrients estimation (Vitamin A, C and E), and Electrolytes concentration by flame photometer (Na<sup>+</sup> and K<sup>+</sup>).

**Estimation of Superoxide Dismutase (SOD)**

SOD was measured and estimated by spectrophotometric method (10).

**Determination of Thiobarbituric Acid Reactive Substances (TBARS) in Tissues**

Malondialdehyde (MDA) was measured by spectrophotometric method (11).

**Estimation of Catalase (CAT)**

CAT was measured by spectrophotometric method (12).

**Determination of Glutathione (GSH)**

GSH was determine by spectrophotometric method (13).

**Determination of Nitric Oxide (NO)**

Nitrite concentration was measured by spectrophotometric method (14).

**Estimation of Vitamin C (VIT C)**

Ascorbic acid (VIT C) was analyzed by spectrophotometric method (15).

**Estimation of Vitamin A (VIT A)**

Vitamin A (Tocopherol) was estimated by spectrophotometric method (16).

**RESULTS:****Table 1: Comparison of Anti-Oxidant Biomarkers between Control and Ovarian Cancer patients**

VARIABLES	CONTROL (n=50)	SUBJECTS (n=50)	P<0.05
MDA	2.25±0.24	8.42 ± 0.53	0.000
GSH	6.35±0.17	0.12 ±0.14	0.000
Catalase	4.16±1.06	0.60±0.52	0.000
SOD	2.15±0.25	1.02±0.02	0.021
AGES	3.35±0.43	0.42±.49	0.000
NO	15.24±2.03	20.18±0.14	0.000

The tables (1) illustrate the anti-oxidant status outline of ovarian malignance patients. Results predicted that serum MDA level in patients is unusually jump high (8.42 ± 0.53) whereas there level in healthy individuals is extremely low (2.25 ± 0.24). The result shows that data is statistically significant in ovarian malignancy patients. (P = 0.000). The value of GSH demonstrates that in cancer patients serum GSH level reduced (0.12 ±0.14) than normal individuals (6.35 ± 0.17). The result reveals that data is statistically important in ovarian malignance patients (P = 0.000). The CAT level is moderately decreased in patients (0.60±0.52) while the value of healthy individuals is high (4.16±1.06). The result reveals that there was a significant change in ovarian cancer patients. (P=0.000). Results demonstrated that serum SOD is slackening in ovarian cancer patients (1.02±0.02) though it is high in normal people (2.15±0.25). The result estimates that there was a significant change in ovarian cancer patients. (p=0.021). The effected patients revealed the low value of AGE's (0.42±.49) while in healthy individual the worth of AGE's is high (3.35±0.43). This indicates the level of significance (P=0.000). Serum Nitric Oxide (NO) level in ovarian cancer patients was jump high (20.18±0.14) than healthy person (15.24±2.03). This indicates the level of significance (P=0.000).

**Table 2: Comparison of Micronutrients between control and ovarian cancer patients.**

VARIABLES	CONTROL (n=50)	SUBJECTS (n=50)	P<0.05
VIT A	7.15±0.47	2 .55±0.17	0.000
VIT C	6.15±1.04	0.40±0.27	0.000
VIT E	4.33±0.97	0.57±0.0.27	0.000

Researchers also reported that reduction in vitamin A has more chances of ovarian cancer risks. Table 2 explained that Patients of ovarian cancer has remarkably deficient vitamin A (2 .55±0.17) from healthy subjects (7.15±0.47). Ovarian cancer patients have strikingly low vitamin C level (0.40±0.27) while its level was high in healthy persons (6.15±1.04). The outcome obtain revealed the worth of significant (P=0.000). There is also reduced level of Vitamin E in effected person (0.57±0.0.27) than normal (4.33±0.97). So it depicts that ovarian cancer patients shows the highly significant behavior (p=0.000).

**Table 3: Comparison of serum electrolytes between control and ovarian cancer patients.**

VARIABLES	CONTROL (n=50)	SUBJECTS (n=50)	P<0.05
SODIUM (Na <sup>+</sup> )	132.29±11.27	154.21±2.04	0.000
Potassium(K <sup>+</sup> )	6.27±0.13	8.11±1.14	0.000

The value of serum sodium level is high in ovarian cancer patients (154.21±2.04) from control subjects (132.29±11.27). This indicates the level of significance (P=0.000).Serum level of potassium have increased value in ovarian cancer patients (8.11±1.14) than normal individual (6.27±0.13). The results show that data was a statistically significant (p=0.000) (Table 3).

**DISCUSSION:**

Antioxidant enzymes play a significant character in the defense of cells from oxidative destruction. A fine stability among oxidants (ROS production) and antioxidants is predominant for the general defensive capacity of cells in difference to oxidative injury. The

antioxidant enzymes i.e. SOD and CAT, extensively dispersed in all cells and are commenced in large quantity in erythrocytes (17). SOD and CAT should be decrease in the patients of ovarian cancer. Low stages of SOD and CAT in ovarian tumor patients. SOD easily enters to other cells and radicals have a potential

to travel across the other membrane and destroy the tissues to other places of the cells. (18). When lipid peroxide ions increase, the action of CAT could be lessened and by the breakdown of enzymes covered the outer layer of the cells MDA could form the links that cross the outer covering (19, 20).

In the cancerous tissues SOD show scarcity might be linked with the lipid peroxides in advance form. By the consumption of enzymes CAT could be slackened as the result of accession per oxidation. In the outer layer of the cell lipid as well as antioxidants that prevent the chain and soluble. (21). Antioxidants which dissolve water and have specific antigen capacity be the part of the cell and ability to reduce.

### CONCLUSION:

Free radicals are developed in both physiological and pathological states in mammalian tissues. MDA level in ovarian cancer patients is remarkably inflated than usual somebody their increased level are the result of metastasis. Whereas their level in healthy individual is extremely low. The value of GSH demonstrates that in cancer patients the level of GSH reduced as related to regular separate. Amount of SOD is slackening in ovarian malignancy patients as compared to regular characters. Ovarian melanoma was an asymptomatic syndrome.

Present Research revealed that an antioxidant-rich diet facilitates in the restraint of ovarian cancer development and helps to minimize ovarian cancer chances. Decreased level of CAT might be due to the elevation in the lipid peroxidation product which may be the reason for the progression of ovarian cancer.

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