ORIGINAL RESEARCH PAPER
Volume-8 | Issue-9 | September - 2019 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ROLE OF CANCER ANTIGEN 125(CA 125) AND LIPID PROFILE IN OVARIAN CARCINOMA PATIENTS.

Biochemistry

Dr. Ruchi Jindal Demonstrator in Biochemistry Department, GMCH, Udaipur, Rajasthan
Dr Manisha* Biochemist in unipath lab Sikar Rajasthan ,*Corresponding Author

ABSTRACT

Background: The term "ovarian cancer" includes several different types of cancer that arise from cells of the ovary, most commonly, tumors arise from the epithelium or lining cells of the ovary. CA-125 is the most frequently used biomarker for ovarian cancer detection. One of the most common and heavily researched screening tools today is elevation of the blood protein CA-125. Robert Bast (1980) first discovered the biomarker and he believes that although the CA-125 blood test is at par with mammography in terms of cost-effectiveness and potential years of life. Ovarian cancer risk is positively associated with higher consumption of dietary cholesterol and eggs, and inversely associated with a higher intake of vegetables. High consumption of fats may increase circulating estrogen levels, thus increasing the possibility of cell damage and proliferation that is responsible for cancerous growth.
Material & methods: The present study was conducted at GEETANJALI MEDICAL COLLEGE AND HOSPITAL, Udaipur (Rajasthan). Total 100 cases (females) attending the obstetrics and gynecology department for some gynecological and other problem were selected for this study between the age of 40-60 years, who were attending cancer centre at GEETANJALI MEDICAL COLLEGE AND HOSPITAL, Udaipur (Rajasthan).
GROUP I: - It consisted of healthy females control subjects (n=50) .By routine examination and tests, we ensured that all the subjects were healthy and there were no signs and symptoms or history of ovarian tumor and diseases.
GROUP II: - It consisted of ovarian cancer females subjects (n=50) with a history of ovarian tumor.
Results: Higher level of cholesterol ,LDL , VLDL and CA-125 are found in ovarian cancer.
Conclusion: The present study we highlights the importance and role of serum CA 125 in diagnosis, prognosis and recurrence of the disease. The study shows that serum level of CA 125 was elevated (more than 35 U/ml) in 48 (96%) patients of ovarian cancer and indicates that CA 125 has high sensitivity for diagnosis of ovarian cancer. The study shows that serum level of cholesterol, LDL, VLDL was elevated in patients of ovarian cancer while low level of HDL are found in ovarian cancer patients.

KEYWORDS

CA-125, lipid profile, Ovarian cancer.

INTRODUCTION:

Ovarian cancer is considered an elusive disease, quietly progressing undetected and usually evading diagnosis until it reaches advanced stage. One of the most common and heavily researched screening tools today is elevation of the blood protein CA-125.[1] first discovered the biomarker and he believes that although the CA-125 blood test is at par with mammography in terms of cost-effectiveness and potential years of life[2].

Several case–control and cohort studies have found positive associations between ovarian cancer and an intake of foods with high levels of saturated fats or cholesterol, such as red meat, eggs, and dairy products3.

Ovarian cancer risk is positively associated with higher consumption of dietary cholesterol and eggs, and inversely associated with a higher intake of vegetables.4

High consumption of fats may increase circulating estrogen levels, thus increasing the possibility of cell damage and proliferation that is responsible for cancerous growth5.

Dietary cholesterol may influence the risk of ovarian cancer through elevated circulating estrogen or progesterone. The repeated rupture of the follicle associated with ovulation, which leads to expose the ovarian epithelium to hormones in the surrounding fluid; high estrogen concentrations may increase the likelihood of tumor development6.
The widely used, classic, "gold standard" tumor biomarker, CA125, is a high molecular weight glycoprotein, has a sensitivity 60% with a specificity of 90% in early stage postmenopausal women, and expression of CA125 is enhanced in 90% of patients with epithelial ovarian cancer above normal levels[3].CA-125 is the most frequently used biomarker for ovarian cancer detection[4]. Around 90% of women with advanced ovarian cancer have elevated levels of CA-125 in their blood. Therefore, CA-125 is a useful tool for detecting ovarian cancer after the onset of symptoms. Increase CA-125 levels within individuals in a remission is a strong predictor of the recurrence of ovarian cancer . Looking to the survey of literature it has been observed that very few studies have been conducted for CA -125 specially in Rajasthan and that too not in this region, so we have planned this study.

MATERIAL AND METHODS:

This Study was conducted in department of biochemistry, Geetanjali Medical College & Hospital, Udaipur (Rajasthan) in collaboration with department of Oncology and gynecology after obtaining institutional ethical committee permission. The total sample of 50 patients including cases (female). Informed consent was obtained from all subjects for participating in the study.

CA-125 was done using the COBAS e-411 ROCHE HITACHI ANALYSER by Electro- chemiluminiscence immune assay (ECLIA)
Estimation of lipid profile was done on Cobas C 311 by spectrophotopteric method.

2) Estimation of serum total cholesterol by CHOD–PAP METHOD (Allain, 1974)
3) Estimation of serum Triglyceride by GPO-TRINDER Method (Bucolo, 1973)
4) Estimation of serum HDL Cholesterol by Precipitation method (Brustein M 1970)
5) Estimation of serum LDL and VLDL Cholesterol by calculation by Frieldwald's formula (Frieldwald 1972)

EXCLUSION CRITERIA: -

Patients having any major systemic illness or having carcinoma other than ovary were excluded from this study.

other than ovary were excluded from this study.

RESULTS:

Table -1: Distribution Between Case And Control

GROUP NAME	NUMBER (n)
Case (Patients of ovarian cancer)	50
Control	50
Total	100

Table – 2: Mean ± Sd And P- Value Of Biochemical Parameter Of Ca125 In Subjects And Control (40 – 60 Yrs)

PARAMETER	TOTAL SUBJETS (40 -60)YEARS (n =50)	CONTROL (40 - 60)YEARS (n =50)
	Mean ±SD	Mean±SD
CA125	129.2±101.8	5.13±4.54

TABLE – 3: MEAN ± SD AND P- VALUE OF LIPID PROFILE IN CASE AND CONTROL

PARAMETERS	CASE MEAN±SD	CONTROL MEAN±SD
LDL	146±53.9	104±29.1
VLDL	33.6±21.7	21.5±7.23
HDL	31.5±9.94	40.3±11.1
TC	203±63.8	166±34.4
TG	155±83.1	108±36

DISCUSSION:

CA 125 is a substances found in the blood called glycoprotein (a sugar associated protein). It is commonly referred to as a "biomarker" – or "tumor marker" – because it provides information about the biological state of ovarian cancer and is obtained by a blood sample from which a level can be measured. **(Foundation for women's cancer 2011).** CA 125 is the standard tumor marker used to follow women during or after treatment for ovarian cancer. More than 90% of women with advanced ovarian cancer have high levels of CA 125 (Normal value of CA 125 is 0 – 35 U/ml). If the CA 125 level is high when the women is first diagnosed, changes in the CA 125 level can be used during treatment to get an idea of how well it's working[8]. In the present study, the blood level of CA 125 was found to be elevated in study Pan SY, Ugnat AM, Mao Y, Wen SW, Jhonson KC. A case– control study of diet and the risk of ovarian cancer. Cancer Epidemiol Biomarkers Prev 2004; 13:1522–7.

group that was 129.2±101.8 U/ml as compared to 5.13±4.54 U/ml in control group and the difference between them was significant ($p < 0.001$). This finding was supported by **Digant and Christopher** (2009). They reported that CA 125 is the gold standard tumor marker in ovarian cancer patients and CA 125 is raised in approximately in 95% of patients with advanced epithelial ovarian cancer while in the present study, CA 125 was raised in 98% patients. Similarly it was observed by **Riedinger et al (2011)** they reported that 90% of women with advanced ovarian cancer have elevated levels of CA 125 in their blood serum. In the present study, we have observed significantly elevated levels of serum cholesterol and triglyceride in the study group as compared to control group. The mean value of serum total cholesterol in study group was 203±63.8 mg/dl and in control group was 166±34.4 mg/dl while that of serum TG is 155±83.1 mg/dl and 108±36 mg/dl respectively, in subjects and control. The difference among them was found to be significant. ($P<0.0001$).

Similarly it was observed by **Carmen et al (2013)** they have reported that abnormal lipid metabolism, leading to increased lipid synthesis would increase the availability of substrate for lipoprotein synthesis. They also reported that cancer cells depend on *de novo* lipid synthesis for the generation of fatty acids to meet the energy requirements for increased tumor growth. There was increasing evidence that lipid metabolism was deregulated in ovarian cancer. In present study, there were significant increase in level of serum LDL and VLDL in the study group as compared to control group. The mean value of serum LDL cholesterol in study group was 146±53.9 mg/dl and in control group was 104± 29.1mg/dl while that of serum VLDL is 33.6±21.7 mg/dl and 21.5±7.23 mg/dl respectively, in subjects and control. The difference among them was found to be significant. ($P<0.0001$). This findings was supported by Scoles et al (2008). They reported those lipoproteins are chemically modified by oxidation. They identified a dose-dependent increase in cellular proliferation of ovarian carcinoma cell lines CaOV3, OVCAR3 and SKOV3 with increasing oxidized LDL concentration. Similarly it was reported by **Andrew Li et al (2015)** according to them there is potential correlation between lipoproteins (LDL, VLDL,) levels and survival in ovarian cancer patients. They also identified a statistically significance association between lipoproteins (LDL, VLDL,) levels and survival in ovarian cancer patients. They also identified a statistically significance association between elevated LDL levels and progression free and overall survival. Molecular studies by **Mack et al (2007)** support a role for elevated LDL in ovarian cancer biology. According to them chemoresistant ovarian carcinoma cells may over express $ABCA_2$, which functions in trafficking of LDL- derived free cholesterol. In the present study, we have observed significantly low levels of serum HDL are found in the study group as compared to control group.

Conclusion: In the present study we have carried out CA 125. this biochemical investigation give us an idea about the prognosis, severity and recurrence of the ovarian cancer disease. The present study we highlights the importance and role of serum CA 125 in diagnosis, prognosis and recurrence of the disease. The study shows that serum level of CA 125 was elevated (more than 35 U/ml) in 48 (96%) patients of ovarian cancer and indicates that CA 125 has high sensitivity for diagnosis of ovarian cancer. Recently it has been shown, that levels of serum lipoproteins (TC, TG, HDL, LDL and VLDL) differ between women with ovarian cancer and those with benign condition. Abnormal lipid profile is implicated in poor survival in ovarian cancer. The present study highlights the importance and role of serum lipoproteins (TC, TG, HDL, LDL, and VLDL) level in prognosis and recurrence of the disease. The study shows that serum level of lipoproteins were abnormal in 43 (86%) patients of ovarian cancer, which indicates the potential correlations between lipoprotein levels and survival in women with ovarian cancer. If validated by independent studies in future, these biomarkers (TC, TG, HDL, LDL, and VLDL) may serve as an adjunct at the time of clinical presentation, to distinguish between women with advanced ovarian cancer and those with early stage of ovarian cancer. Therefore we must have a check all biomarkers (TC, TG, HDL, LDL and VLDL) in the females who are more than 40 years. We have to educate, aware the females about the screening of ovarian cancer. For this large a number of health worker, teachers, ward sarpanch, NGO's and social workers, should come forward, they should go door to door to make them aware and educate about the incidence, prognosis and screening of ovarian cancer, specially in adult females (more than 40 years).

REFERENCES:

1. Rapkiewicz AV, Espina V, Petricoin EF III, Liotta LA. Biomarkers of ovarian tumours. Eur J Cancer 2004, 40:2604-2612.
2. Quirk JT, Natarajan N. Ovarian cancer incidence in the United States, 1992-1999. Gynecol Oncol 2005, 97:519-523.
3. Kushi LH, Mink PJ, Folsom AR. Prospective study of diet and ovarian cancer. Am J Epidemiol 1999;149:21–31
4. Pan SY, Ugnat AM, Mao Y, Wen SW, Jhonson KC. A case– control study of diet and the risk of ovarian cancer. Cancer Epidemiol Biomarkers Prev 2004; 13:1522–7.
5. Bertone ER, Rosner BA, Hunter DJ. Dietary fat intake and ovarian cancer in a cohort of US women. Am J Epidemiol 2002; 156:22–31.
6. Hill MJ, Goddard P, Williams RE. Gut bacteria and aetiology of cancer of the breast. Lancet 1971; 2:472–3
7. Carmen E. Pyragius, Maria Fuller, Carmela Ricciardelli. Aberrant Lipid Metabolism: An Emerging Diagnostic and Therapeutic Target in Ovarian Cancer. Int. J. Mol. Sci.2013; 14: 7742- 7756.
8. MackGuire WP, Hoskins WJ, Brady MF, Kucera PR, Partridge EE, LookKY, Clarke-Pearson DL, Davidson M. Cyclophosphamide and cisplatin compared with paclitaxel and cisplatin in patients withstage III and stage IV ovarian cancer. N Engl J Med 1996; 334:1-6.