



## MEASURE OF SERUM MDA, GST AND VIT-C IN WOMEN WITH CERVICAL CARCINOMA

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**ABSTRACT** Cervical carcinoma (CaCx) is the second most common gynecological cancers globally. Many authors revealed that low levels of antioxidants induce the overproduction of reactive oxygen species (ROS) that result in oxidative stress. In the present study an attempt was made to evaluate the oxidative stress in 20 women with cervical carcinoma by measuring serum Malondialdehyde (MDA), Glutathione-S-transferase (GST) and Ascorbic acid (Vit-C) levels which was compared with 20 age matched non cancerous women. Significantly elevated MDA levels ( $P<0.001$ ) and lowered GST, Vit-C levels ( $P<0.0001$ ) were observed in women with cervical carcinoma as compared with healthy controls. From our findings it can be concluded that oxidative stress plays an important role in pathogenesis of cervical carcinoma. Hence supplementation of antioxidants may reduce the oxidative stress and minimize the associated morbidity and mortality.

**KEYWORDS :** Cervical carcinoma (CaCx), Reactive oxygen species (ROS), Malondialdehyde (MDA), Glutathione-S-transferase (GST) and Ascorbic acid (Vit-C).

### INTRODUCTION

Cervical carcinoma is the most prevalent genital tract cancer and is one of the leading causes of deaths due to cancer among women world wide and in India. Several risk factors of cervical cancer such as smoking, oral contraceptives, immune-suppression and infection with HPV are well documented to increase oxidative stress<sup>(1,2)</sup>. During infection, free radicals i.e pro-oxidases are generated by which antioxidants are depleted leading to development of oxidative stress<sup>(3)</sup>. The imbalance between these pro-oxidants and anti-oxidants called oxidative stress is assessed by Malondialdehyde (MDA) a lipid peroxidation product<sup>(4,5)</sup>.

Glutathione-S-transferase, a secondary antioxidant enzyme helps in the detoxification of ROS by decreasing peroxide levels or it maintains the steady supply of metabolic intermediates glutathione reductase for the primary antioxidant enzymes<sup>(6)</sup>. Many studies have evidenced an altered expression of GST in plasma and also in tissue biopsy samples of CaCx<sup>(7)</sup>.

Ascorbic acid reacts with ROS, converting them into semi hydro-ascorbate radicals, reducing the risk of cancer by suppressing free radicals and oxidative stress<sup>(8)</sup>. Recent studies have shown that ascorbic acid molecule has a direct impact on cervical carcinogenesis<sup>(9)</sup>.

### MATERIALS AND METHODS

The present study was conducted on 40 women in the department of Biochemistry, among them 20 were diagnosed with Cervical carcinoma aged between 35-65 years, selected from the department of Gynecology, Government Maternity Hospital and Sri Venkateswara Medical College, Tirupati and other 20 were age matched healthy non-cancerous controls. written consent was procured from every participant included in the study.

5ml of venous blood was collected from all the participants with aseptic precautions into plain tubes and centrifuged. The obtained serum was analyzed for Malondialdehyde (MDA), Glutathione-S-transferase (GST) and Ascorbic acid (VitC) spectrophotometrically. MDA is determined as a measure of Thiobarbituric acid reactive substances. (TBARS)<sup>(10)</sup>, GST activity was measured using 1, chloro 2, 4 dinitrobenzene as the substrate (CDNB)<sup>(11)</sup> and vitC estimation by Roe,J.H., and Kuether, C.A method<sup>(12)</sup>.

The data obtained from both groups was expressed as mean  $\pm$  S.D., students t-test was used for statistical analysis and p-value  $< 0.01$  for statistical significance as shown in table 1.

**Table 1:** Mean and SD values of MDA, GST and Vit C in cases and controls

S.no	Parameters	Means $\pm$ SD		P Value
		Cases (n:20)	Controls(n:20)	
1	MDA (nmol/L)	5.69 $\pm$ 1.61	3.34 $\pm$ 0.93	< 0.001
2	GST (IU/L)	36.84 $\pm$ 17.17	72.73 $\pm$ 19.33	< 0.001
3	Vit C (mg/dl)	0.2 $\pm$ 0.07	1.07 $\pm$ 0.56	< 0.001

There was a significant raise in MDA levels ( $P<0.001$ ) and a significant fall in GST and Vit C levels ( $P<0.001$ ) among CaCx cases when compared with controls.

### DISCUSSION

Oxidative stress is an imbalance between production of ROS in cells and tissues and the capability of the biological mechanisms to detoxify these reactive products<sup>(13,16)</sup>.

Oxidative stress plays an important role in development of carcinogenesis by generating free radicals (or) by reducing antioxidant levels<sup>(14,16)</sup>.

In our study an attempt was made to assess the extent of oxidative stress in terms of lipid peroxidation product MDA, antioxidant enzyme Glutathione-S Transferase activity and the antioxidant vitamin, Ascorbic acid levels in women with cacx. Significantly elevated MDA levels ( $P<0.001$ )<sup>(4,5,15,16)</sup>, and lowered GST and Ascorbic acid levels ( $P<0.001$ )<sup>(7,8,15)</sup> were observed in CaCx patients when compared with controls. This confers that low levels of antioxidants in these patients may be due to their over use in scavenging lipid-peroxides as well as sequestration by tumor cells.

### CONCLUSION

Our study concludes that oxidative stress plays a significant role in the pathogenesis of CaCx and it emphasizes that there is a need for supplementation of Antioxidants which may reduce the oxidative stress and minimize the associated morbidity and mortality.

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