ISSN 2348-313X (Print)
International Journal of Life Sciences Research ISSN 2348-3148 (online)
Vol. 5, Issue 2, pp: (123-125), Month: April - June 2017, Available at: www.researchpublish.com

# PROSTAGLANDINS LEVEL IN PLASMA OF CANCER PATIENTS

O.C Ojo

Department Of Biochemistry, Ekiti State University, Ado-Ekiti, Nigeria

***Abstract:*** **Plasma prostaglandins (PG) level was measured in 45 patients suffering from eight (8) different types of cancer (leukemia, ovarian, prostate, breast, colon, cervical, uterine, ovarian) attending Ekiti State University Teaching Hospital, Ado Ekiti and Federal Medical Center Ido Ekiti, Nigeria. Forty five (45) healthy subjects served as the control subjects. The Plasma prostaglandins level was estimated by ELISA method as described by Vanweemen and Schuurs (1971). Elevated levels of $PGE_2$ (ng/ml) was recorded in most of the cancer patients with highest level in breast cancer patients when compared with the control subjects and among the various cancer types. Plasma $PGE_1$ (ng/ml) level was found to reduce significantly ($p<0.05$) in most of the cancer patients with leukemia having the lowest value. However, results obtained from this study may provide clues for future studies of other fractions of prostaglandins in the search for reliable prognostic indicators for cancer.**

***Keywords:*** **Prostaglandins, cancer, plasma, beast, leukemia.**

## 1. INTRODUCTION

Prostaglandins (PGs) are lipid signal substances derived from essential fatty acids together with thromboxanes (TX) and prostacyclins ($PGl_2$), they form the prostanoid class of fatty acid derivatives (Bowen, 2000). The Prostanoid class is a subclass of eicosanoids. PGs act in a manner similar to that of hormones by stimulating target cells into action. However, they differ from hormones in that they act locally, near the site of synthesis and are metabolized very rapidly(Wang and Dubois,2006).

Prostaglandins (PGs), particularly of the E series and their receptors had been found to play a predominant role in promoting cancer progression. Excess prostaglandin E production by tumours appears to be responsible for occasional cases of hypercalcaemia and may contribute to the development of metastatic disease (Karmali et al., 1983). The ever increasing list of references presenting evidence of enhanced PG content and synthetic capacity in many human tumours of different types therefore makes the reasons for continuing to study PGs in cancer compelling.

Recently, it has been suggested that the only other COX-2 derived prostaglandin implicated in oncogenesis is thromboxane $A_2$ ($TxA_{2)}$, which was reported to promote angiogenesis (Eufemia *et. al.*, 2008) and have physiological pathological effects formerly attributed to the PGs.

This study estimates and compares the levels of PGE1 and PGE2 in the plasma of cancer patients with eight different cancer types.

## 2. MATERIALS AND METHODS

The study includes 45 freshly diagnosed patients who were attending Ekiti State University Teaching hospital and Federal Medical Center Ido Ekiti, Nigeria. All biopsies, and pathological evaluation was made in the hospitals. Intravenous blood (5ml) was carefully collected from the subjects into labelled heparinised bottles. The blood sample was immediately centrifuged at 10,000 revolution per minute (10,000rpm) for ten (10) minutes and separated to obtain plasma. The samples were then stored at $4^oC$ prior to analysis. PGE1 and PGE2 were estimated by ELISA method as described by Vanweemen and Schuurs (1971).

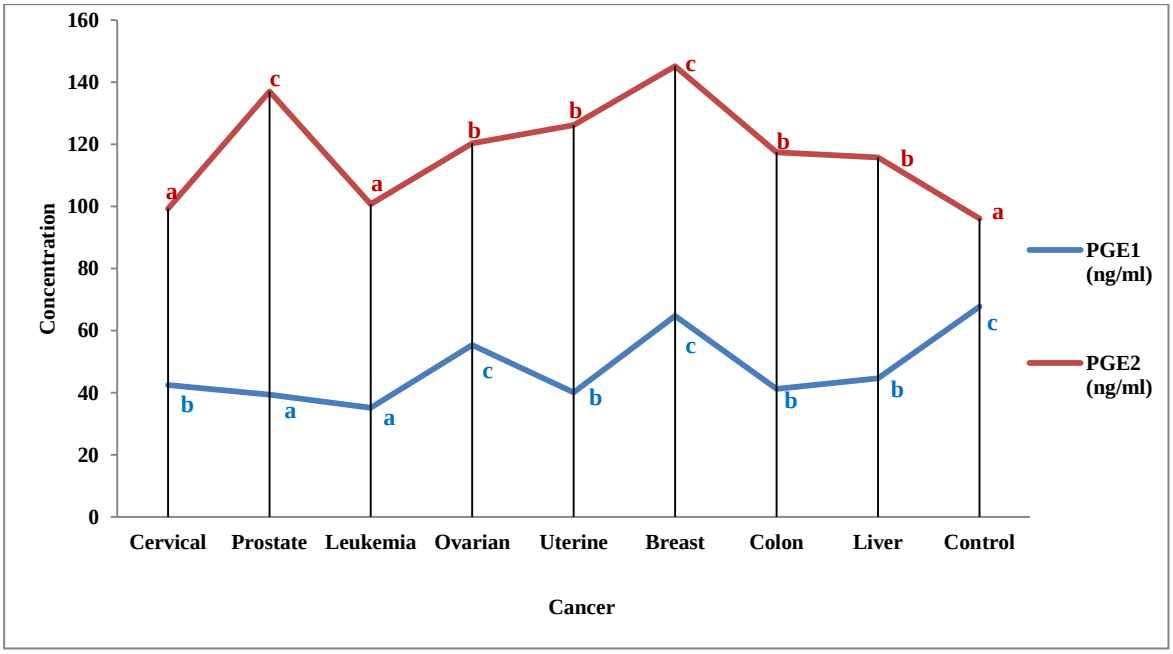
ISSN 2348-313X (Print)
International Journal of Life Sciences Research ISSN 2348-3148 (online)
Vol. 5, Issue 2, pp: (123-125), Month: April - June 2017, Available at: www.researchpublish.com

50µl antiserum, peroxidise conjugate ($PGE_1$ and $PGE_2$) and 100µl sample/standard containing 25% Methoxyamine (MOX) solution were pipette into the appropriate wells and thoroughly mixed. 50µl peroxidise conjugate and 100µl buffer were also pipette into $B_o$ (zero) and NSB wells and thoroughly mixed. The plates were incubated overnight at 4°C after which, they were washed 4 times in wash buffer. 200µl of streptavidin peroxidase diluted in 1:200 assay buffer was added and incubated in a shaker for 20minutes at room temperature, after which they were washed thoroughly with buffer. 200µl of TMB (Tetramethyl benzene) substrate was then added per well and thoroughly mixed. The plates were then left for 20minutes for colour development. After this, 50µl of 2N sulphuric acid per well was added and mixed for 3minutes to stop the reaction. The plates were read and recorded at 450nm wavelength. All standards and samples were run in duplicates for all assays while PG values were determined by Assay zap analysis software (Biosoft).

The data collected were analysed using one –way Analysis of variance (ANOVA) and Duncan Multiple Range test. The results obtained from the cancer patients were compared with the control subjects (Zar, 1984).

## 3. RESULTS

**Figure 1: Concentration of Prostaglandins in the plasma of cancer patients and control Subjects.**




Results were expressed as means ± standard deviation. Graphs of same parameter with different data labels indicate significant difference at ($P < 0.05$).

## 4. DISCUSSION

The level of some prostaglandin fractions $E_1$ and $E_2$ were shown in Figure 1.0. Elevated levels of $PGE_2$ (ng/ml) was recorded in most of the cancer patients; breast cancer patients (145.10 ± 1.78), uterine cancer patients (126.12 ± 2.24), ovarian cancer patients (120.32 ± 2.11), liver cancer patients (115.76 ± 1.98), colon cancer patients (117.43 ± 1.18) and prostate cancer patients (137.01 ± 2.00) with highest level in breast cancer patients when compared with the control subjects (96.10 ± 2.16) and among the various cancer types. However plasma $PGE_1$ (ng/ml) level was found to reduce significantly ($p<0.05$) in most of the cancer patients. Elevated levels of $PGE_2$ have been previously reported by Markus *et. al.*, (2006) in patients with solid tumors. The increase in plasma level of $PGE_2$ in cancer patients in this study, could be due to the ability of $PGE_2$ to promote tumor growth by binding its receptors and activating signaling pathways which control cell proliferation, migration, apoptosis and/or angiogenesis (Wang and DuBois 2006). $PGE_2$ has also been found to be a progesterone antagonist, which could be the reason why the level of progesterone was found to be significantly high in most of the cancer types. Low level of $PGE_1$ was observed in most of the cancer types. This could be due to the fact that $PGE_1$, acts as an anti-inflammatory factor by exerting anti-inflammatory activity through the activation of peroxisome proliferator-activated receptor-γ (Eufemia *et. al.*, 2008).

## 5. CONCLUSION

The elevated plasma levels of $PGE_2$ in most of the cancer types and risk of developing cancer as observed from this study could be used as tumor markers in the prognosis and management of malignancies.

## REFERENCES

[1] Bowen R., (2000): "Placental hormones". *Journal of Clinical Biochemistry*23 (2): 456-459.

[2] Eufemia C., Finocchiaro R., Celli M., Zambrano A., Tetti M., Villani C., Persiani P., Mari E. and Zicari A. (2008): High levels of Prostagladin E2 in children with Osteogenesis reduced by neridronate treatment. *Pediatrics Research*, 63(2): 203-206.

[3] Karmali R.A., Welt S., Thaler H.T. and Lefevre (1983). Prostaglandins in breast cancer: Relationship to disease stage and hormone status. *British Journal of Cancer* , 48, 689-696.

[4] Markus H., Mehran M.D., Wangeblast M.D., Johannes S., Helena B. and Rainald K. (2006): Inverse correlation between serum PGE2 and T Classification in Head and Neckcnacer.WileyInterscience (www.interscience.wiley. com). Do I: 10. 10002/ hed. 20503.

[5] Van Weemen B.K. and Schuurs A. H. (1971): Immunoassay using antigen-enzyme conjugates. *FEBS Lett*. 15(3): 232-236.

[6] Wang D. and Dubois R.N. (2006): Prostaglandin and cancer. *Journal list*>ant>55(1).PMC 18556377.

[7] Zar J. H. (1984): Multisample hypotheses: The analysis of variance: Biostatistical Analysis, 2nd ed. Englewood Cliffs, NJ Prentice-Hall, Inc. 162-184.