BIOCHEMICAL AND HEMATOLOGICAL CHANGES DURING THE COURSE OF RADIOTHERAPY IN CERVIX CANCER PATIENTS IN GWALIOR REGION OF INDIA

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Summary

Cervix cancer is one of the most common cancers accounting for 60% of all malignancies in women. Radiotherapy is one of the tools for treatment of cancers and due to the Co^{60} radiation the biochemical and hematological profile is changed because the Kidney and liver functions are affected.

The present study started with fifteen patients which are clinically established and histopathologically proved patient of cervix and all the above cases due to radiotherapy the mean value of the glucose, Urea, Creatinine, Enzymes and hematological parameters is decrease and this shows that the assessment of hematological and biochemical parameters during the course of radiotherapy helps the clinician to determine the amount of doses with minimum toxicity.

Key Words : Histopathology, Chemotherapy, Radiothearpy

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Introduction

Cervical carcinoma has its origins at the squamous columnar junction whether in the endocrine canal or on the portion of the Cervix found in 23.5% female of India. The prognosis for this disease is markedly affected by the extent of disease at the time of diagnosis . Among the major factor that influence prognosis are, stage, volume, grade of tumor , histologic type, lymphatic spread and vascular invasion.

Radiotherapy is a common way to treat cervical cancer because radiation treatment is usually fractionated that is given in a series of daily doses spread over a number of weeks.

Biological systems are extremely sensitive to radiation, infact, while a whole body dose of 5 Gy will kill many mammals and the aim of the radiotherapist in treating a patient is to deliver enough radiation to the tumor to destroy it without irradiating normal tissue. During radiotherapy, high energy X-ray are used to kill cancer cells. Radiotherapy can be administered by a machine that aims X-ray at the body or by a machine or by placing small capsules or radioactive material directly into the cervix. Many patients receive both kinds of radiation therapy. In cervical cancer, radiation therapy may be used instead of surgery or it may be used after surgery to destroy remaining cancer cells in stage IB-IV A. Cervical cell radiotherapy is administered concurrently with chemotherapy[1]

In cervical cancer patients that is treated with radiation cobalt-60 the kidney and liver functions are affected so the biochemical and hematological parameters will be changed.

In general tumor markers may be used for diagnosis of carcinoma and for monitoring effect of therapy as well as target for localization and therapy. A tumor marker may be produced by the tumor cell and be detectable in body fluid. Enzymes were one of the first groups of tumor markers identified. Their elevated activities were used to indicate the presence of cancer. The form of experimental biochemical parameter serum sample of cancer patients is therefore have been in research for searching probable markers of cancer and the study includes alteration of bicostituents and alteration of enzyme activities in cervical cancer patients during the course of radiotherapy[2].

Material and Methods

Blood sample of radio therapeutic treated cervical cancer patients was collected from Cancer hospital & Research Institute, Gwalior (M.P.). The experiments had been conducted in two phases. In first phase of study blood sample from 10 healthy controls and fifteen histopathlogically proved cervix cancer patients were collected at day first (pre level) and in phase two of experiment blood sample of fifteen samples of cervix cancer patients was collected. After 30 days of treatment (post level) various biochemical and hematological parameters were analyzed.

The details of biochemical and hematological parameters is as follows:

Biochemical Parameters:

Glucose estimation by using glucose oxidase and peroxidase (GOD-POD) Method[3]
Urea estimation by Diacetylmonoxime Method[4]
Serum Creatinine estimatimation by Alkaline Picrate Method[5]
Serum Glutamate Oxaloacetate Transaminase (SGOT) activity was estimated by DNPH Method. [6]
Estimation of Serum Glutamate Pyruvate Transaminase (SGPT) activity.[6]
Estimation of Alkaline Phosphatase Activity. [7]

Hematological Parameters:
The techniques are concerned mainly with the cellular formed elements of blood, their number or concentration. For this we performed the amount of Hemoglobin, Blood cell count (WBC) and Differential Leucocytes Count (DLC).

Results

Table 1. Status of Enzymes in Healthy Control

Mean	**SGOT (I Unit)**	**SGPT (I Unit)**	**ALP (I Unit)**
n = 10	24.5	29.5	7.071

Alteration of Enzymes during Treatments

Treatments Mean n=5	**At the Time of Admission**			**After 30 days of Treatment**		
	SGPT	**SGOT**	**ALP**	**SGPT**	**SGOT**	**ALP**
Internal Radiation	38.6	32.8	9.232	33.8	31	8.30
External Radiation	38.2	42.2	9.362	34.4	36.4	9.16
Chemo+ Radio	28.6	28	7.39	32.6	40	8.49

Table 2. Biochemical Constituents in Healthy Control

Mean	**Blood Sugar (mg/dl)**	**Serum Creatinine (mg/dl)**	**Urea (mg/dl)**
n = 10	105.4	0.968	30.1

Alteration of Biochemical Constituents during Treatments

Treatments Mean n=5	**At the Time of Admission**			**After 30 days of Treatment**		
	Blood Sugar (mg/dl)	**Serum Creatinine (mg/dl)**	**Urea (mg/dl)**	**Blood Sugar (mg/dl)**	**Serum Creatinine (mg/dl)**	**Urea (mg/dl)**
Internal Radiation	79.2	31.6	0.85	69.2	35.2	0.494
External Radiation	100.2	33.4	0.72	90.8	30.8	0.504
Chemo+ Radio	119.5	24.6	0.86	124	22.3	0.76

Table 3. Hematological Parameters

Mean, n=10	**WBC**	**Hb**	**Platelet**	**Polymorph**	**Lymphocytes**	**Eosinophiles**	**Monocytes**
Healthy Control	5500	13.79	268	66.1	28.8	1.3	0.2
Time of Admission	7100	10.76	44771	69.3	17.2	0.8	0.9
After 30 days of Ext. Radiation	4550	9.76	7.487	44.494	28.8	4.1	0.14
After 30 days of Chemo+Radio	1060	8.7	0.84	18.2	11.6	1.3	-

Discussion

In cervical cancer patients, a change of level during the time span 30 days is noted. From the detailed survey of literature it has been observed that different biochemical and hematological profile may get slightly altered, in cervix cancer patient due to describe change in metabolic rate as well as toxicities induced by different therapy.

Enzyme namely SGPT and SGOT is located in hepatic cell and when these cell are damaged and Transaminase are released in the blood stream so the value of these enzymes and ALP (Alkaline Phosphatase) before starting their treatment showing normal value but after treatment values are slightly decrease which shows the patients was not able to tolerate these radiation and hence care is required.[1]

Mean values of all these patients the level of enzymes decreasing after the external and internal radiotherapy and bioconstituents are not very much altered which shows that external and internal radiation are not so much important for biochemical point of view. But clinician decides the dose Ext. & Internal and combination of Chemotherapy to patients depends upon the stages and conditions of the patients.[8]

In present study the effects of hematological parameter of patient is slightly change after radio and chemotherapy. In chemotherapy drugs was noted are blinomycin, Methotrexate, Cisplastin etc. Patients are also received support system treatment in the form of iron antibiotics, calcium and Vitamin.

Conclusion

Study of the above parameters it has been observed that above parameters remain unchanged if proper care is taken to avoid side effects. These encouraging results gives the reason for optimism the cervical cancer may be easily curable with specific dose of radiotherapy but if the condition of patient is severe then both the therapy is required.

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