SERUM COPPER LEVEL DIAGNOSTIC AND PROGNOSTIC VALUE IN FEMALE GENITAL MALIGNANCY

by

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Still, even in the modern era of medical science, cancer is burning and threatening problem, as it is the second most common cause of death after heart disease. Various biochemical tests have been evaluated to detect malignancy in earlier stages, yet remains contraversial. It has been found that destruction of tissues result to release of copper element and high level of copper was detected in various malignancies.

The present study is an attempt, to estimate the serum copper level in various malignancy and probable role in prognosis of disease.

Materials and Methods

The present study was conducted at Associated Group of Hospitals, Bikaner on 60 admitted cases of various genital malignancy in year 1979-80. Ten cases were taken as control, were of reproductive age group and free from medical and gynaecological disease and were not taking hormones. In 50 cases, after admission a detailed history was taken and thorough clinical and systemic examination was made to confirm the clinical staging of malignancy. Routine and special investigation were done in all cases. The clinical, histopathological and serological (serum copper level) findings were correlated.

The clinical staging of malignancy were done according to F.I.G.O. classification.

The patients were subjected to the various modulation of the treatment viz—surgical—curative or pallitive radiological or chemotherapeutic or a combination of these methods. Serum copper levels in test groups were estimated 4 times in following way:

1. ± Reading—1st day of admission before start of specific treatment.
2. Reading on 10th day of start of treatment.
3. Reading at the end of treatment.
4. Followup after 1 month.

Serum copper level was estimated by Gubler's method (1952).

Observations

In present study, in test group, youngest patient was of 30 years of age, while oldest of 65 years. 50% of patient were of age of 46 years or above. 98% of patients were Hindus and 60% were belonging to rural areas. On analysing

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the parity status, 60% were grand multipara, while only 4% were primipara. It was of interest that not a single patient in study was educated upto matric and majority were illiterate (90%), Housewives (86%) and belonging to low economic group (54%). 58% of female were married in between 11-15 years of age. 6% below the age of 10 years, while 36% between 16-20 years of age. They started marital life after (6 months—1 year) of marriage. There was no H/O polygamy.

In Control

In control group, females were of 17 to 46 years of age, having equal socio-economic status, but free from disease, and not taking hermones.

Table I shows the serum copper level in the control and test group according to the clinical stagings.

Discussion

Biological markers are being utilized for the diagnosis and to assess the host response to the treatment in a variety of malignant diseases and serve as an important aid for effectively monitoring cancer therapy.

So the present study, shows a different role as serum copper level in the prognosis of various genital malignancies.

Serum Copper Level in Healthy Individuals

In present study, serum copper level in normal healthy individual was found to be ranging from 79.5 to 135.0 mcg./100 ml. mean 108.77 ± 22.69 and S.E. 7.18 mcg. it is an good agreement with values of published by Valle 1952 (110 ± 13 mcg%) Wintrobe *et al* 1953 (109 ± 17 mcg%) Sood *et al* (72.3 to 135.8 mg%) and Keshava *et al* 1977 (85 to 150 mcg%).

A slightly higher reading were observed by Brider *et al* 1978 (115 ± 17 mcg%) and lower by Johnson 1959 (99 ± 15 mcg) and Martin H in 1968 (101 ± mcg%).

TABLE I

Serum Copper Level in Control and Test Groups

Control Group	No. of cases	Range of SCL/100 ml in Mcg.	Mean of SCL in Mcg/100 ml
	10	79.5 to 135.0	108.77 ± 22.69 S.E. 7.18

Test Group

Clinical Staging	No. of cases	Serum Copper Level in Mcg/100 ml. mean with S.D.			
		Before treatment	10th day of treatment	End of treatment	Follow up
0	2	135.85 ± 3.60	133.35 ± 3.03	133.26 ± 2.93	131.46 ± 4.30
I	3	150.33 ± 9.60	147.95 ± 10.37	133.43 ± 11.09	129.23 ± 17.84
II	16	163.88 ± 31.55	162.53 ± 29.22	158.88 ± 20.63	153.79 ± 21.05
III	27	177.24 ± 54.48	173.3 ± 46.65	172.63 ± 35.54	167.9 ± 34.45
IV	2	212.3 ± 25.51	211.25 ± 21.82	207.57 ± 21.84	202.58 ± 21.67

The variation in the reports of serum copper level were attributed in the use of different techniques and the age of patient. It has been found that younger the patient will be higher the serum copper level (Wintrobe 1952).

Serum Copper Level in Test Group

The significance of Copper level in relation to age parity, religion, socio-economic status marital life was not found significant in present study. It was only significant with the clinical staging of the disease.

Serum copper level was proportional to the extent of tissue involvement as shown in Table I. In control group 108.77 ± 22.69, while in stage 0 it was 135.85 ± 3.60 with the advancement of disease in stage IV, serum copper level was 212.3 ± 25.51 mcg%. It was double of level of serum copper in control group. Wintrobe (1953) Martin (1973), Fisher *et al* (1976) Sood *et al* (1976) are in consonance with our observation.

Mechanism of rise in serum copper level with the advancement of malignancy is not very clear. Probably the intestinal barier to the copper ion were lower with advancement of disease (Underwood 1956).

Sood *et al* (1976) explains that this increase in the level of serum copper element is due to tissue injury leading to subsequent destruction and necrosis which causes release to extra copper element in the serum when the destruction will be more (advanced malignancy) level of copper will be high.

In the second reading, taken on the 10th day of treatment there is slight fall in the level of serum copper level in present series. This level was more significant in stage 0 and stage 1 than in advanced case.

It was probably due to known fact that maximum control of disease will be possible in earlier stages of malignancy, while in third and fourth complete eradication of disease is not possible the high level of serum copper was noted (Table I).

In third reading, significant fall was noted in only stage, 0 and I and II, while in stages II and IV it was less significant. In follow up fourth reading there was little fall in serum copper level in stages III and IV. It shows that when tumour responds to treatment, there will be fall in serum copper level in vice versa. This lowering of serum copper level was associated with the decrease in size of tumour mass as well as relief in the clinical sings and symptoms in follow up.

It can be stated, even though it is an embryonic statement that, serum copper level rises in genital malignancy and it has a definate prognostic value for genital malignancy.

Summary and Conclusion

In 50 cases of genital maligrancy, serum copper level was found elevated in comparison to control which was directly proportional to the stages of malignancy fall in serum copper level was observed in stage 0 and I (Statistically significant) after 10 days, 1 month after treatment. Correlation between serum copper level and extent of disease suggest that it may prove to be very important guide in prognosis of the disease.

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