HUMAN CHORIONIC GONADOTROPIN (ß-HCG) AS A TUMOR MARKER IN CERVICAL NEOPLASIA

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SUMMARY

During August 1993 to July 1994, 50 cases of cervical neoplasia and 25 control cases (normal and women with benign diseases) were studied by the serono-seroenzyme kit for the estimation of serum and urine ß-hCG. In 50 cases of neoplasia 46 cases were invasive carcinoma cervix and 4 cases were dysplasia. The mean ß-hCG in serum and urine of control group was 7.4 mU/ml and 6.8 mU/ml respectively. In cervical dysplasia both serum, and urine ß-hCG levels were lower than in control group. Elevated serum ß-hCG (> 10 mU/ml) was found in 10/46 (21.3%) cases of carcinoma cervix, the range of serum ß-hCG was 3 to 158 mU/ml. 92% cases were squamous cell carcinoma and ß-hCG was significantly raised in squamous cell carcinoma (mean 14.3 mU/ml) than adenocarcinoma (mean 4.4 mU/ml). Serum ß-hCG difference between two consecutive stages of carcinoma cervix from stage II to IV was significant. Serum ß-hCG was found higher in poorly differentiated (mean 25.1 mU/ml) then in well differentiated carcinoma (5.3 mU/ml). No significant difference was found in the urine ß-hCG in various study groups. In conclusion, the study suggests that serum ß-hCG may form an important parameter for assaying tumor burden. However, its diagnostic significance requires further studies in large number of cases.

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INTRODUCTION

The tumor markers are useful tools that aid the clinician in early diagnosis

and evaluation of the efficacy of the treatment of cancers, and in prediction of recurrence before the disease becomes clinically evident. While a variety of circulating markers (carcino-embryonic antigen CEA and squamous cell carcinoma antigen S.C.C.) have been proposed for this tumor, none have achieved sufficient sensitivity and specificity to be used in early diagnosis and monitoring of therapy.

In the present study, attempt has been made to monitor ectopic secretion of ß-hCG in serum/urine of the patients with carcinoma cervix in order to derive an insight into the role of the placental hormone as possible marker and its relevance in clinical stages and histological grading of the disease

MATERIAL AND METHODS

The study was carried out in 75 cases, Department of Obstetrics and Gynaecology of King George's Medical College, Lucknow, from August 1993 to July 1994. Out of 75 cases, 25 served as control group comprising of infertile women, women with prolapse uterus and women with benign diseases, while 50 cases of cervical neoplasia comprised the study group. Out of 50 cases 46 were of cervical carcinoma and 4 of cervical dysplasia.

For selecting cases a detailed history, general examination and specific investigations were carried out to rule out cases of pregnancy, trophoblastic diseases, breast carcinoma and other malignancies.

5 c.c of blood was taken in disposable syringe and serum was separated within 6 hours by centrifuging it at 2500 r.p m. for 10 minutes The separated specimen of serum was then stored in refrigerator at 4°C For urinary ß hCG morning urine sample was collected in clean vial Cellular and crystalline material was removed from turbid urine samples by centrifugation. The urine samples were stored at 4 c for estimation of urinary ß-hCG

The estimation of serum and urinary B-hCG were carried out by the serono hCG seroenzyme kit (Manufactured by Serono Diagnostic SA, 1267 Coism, Switzerland)

RESULTS

Results of serum and urinary ß-hCG in control case, cervical dysplasia and cervical carcinoma have been shown in Table I. However, in one case of cervical cancer the serum ß-hCG level was found very high 158 mU/ml. If this case is excluded the serum ß-hCG in cancer cervix cases was 10.27 mU/ml, which is much higher than in cervical dysplasia cases and in controls.

Levels of ß-hCG in urine of ditferent cases has shown insignificant differences in the three groups but in cervical dysplasia it was lower than in controls

The study shows a higher serum ß-hCG level in cervical neoplasia cases in the fertile age group (21-30 years) and perimenopausals (41-50 years) (Table II). Similar trend was also seen in urinary samples

TABLE I
LEVELS OF B-hCG IN SERUM AND URINE OF CONTROLS AND CERVICAL NEOPLASIA

Group	No. of Cases	Serum B-hCG mU/ml		Urinary B-hCG mU/ml	
		Rang	Mean	Range	Mean
Controls	25	1.6 - 15.8	7.4	2.6 - 30.2	6.8
Cervical Dysplasia	4	3.0 - 7.7	4.8	3.4 - 6.7	4.3
Cervical carcinoma	46	3.0 - 158	13.8	1.8 - 23.5	5.15

TABLE II
SERUM B-hCG LEVELS IN RELATION TO AGE

Age (yrs)	No. of Case	Control Group Serum B-hCG mU/Ml		No. of cases	Study Group Serum B-hCG mU/ml	
		Range	Mean		Range	Mean
21 - 30	5	7.3 - 9.7	8.36	4	7.6 - 78.5	27.7
31 - 40	5	1.6 - 11.6	5.62	24	3.0 - 25.6	6.6
41 - 50	11	3.6 - 15.6	8.97	18	4.0 - 158	20.2
50 - 60	4	1.75 - 3.6	2.6	4	5.2 - 11.2	6.7

Levels of serum and urine ß-hCG were also investigated in relation to various clinical stages of carcinoma cervix (Table III). As regards serum ß-hCG levels, although no significant difference was seen in stage I and II cases a definitive rise in level was evident with further advancement of the stage of disease. However, in urine sample, this pattern is limited to only stage IV. It should however be mentioned that there was only

TABLE III
SERUM AND URINE ß-hCG LEVELS IN CARCINOMA CERVIX CASES IN RELATION TO CLINICAL STAGE

Clinical Stage	Serum ß-hCG mU/ml		Urine ß-hCG mU/ml	
Range	Mean	Range	Mean	
I (13 cases)	3.0-25.6	7.9	2.5-6.8	5.1
II (12 cases)	3.8-13.6	6.9	3.6-7.1	4.9
III (19 cases)	4.0-78.6	17.6	1.8-6.1	4
IV (1 case)	158	-	23.5	-

TABLE IV
SERUM AND URINE B-hCG LEVELS IN CARCINOMA CERVIX IN RELATION TO HISTOPATHOLOGICAL GRADING OF DIFFERENTIATION

Degree of Differen-tiation	Serum B-hCG mU/ml		Urine B-hCG mU/ml	
	Range	Mean	Range	Mean
Highly (5 cases)	4.0 - 7.6	5.3	3.8 - 6.1	4.5
Moderately (22 cases)	3.0 - 13.6	4.2	2.6 - 6.8	4.6
Poorly (19 cases)	4.0 - 158	25.1	1.8 - 23.5	5.8

one case of stage IV carcinoma cervix with bladder involvement and metastasis in lungs. Serum ß-hCG level in this case was 158 mU/ml and urine ß-hCG 23.5 mU/ml.

The serum and urine ß-hCG values

Table V
SERUM AND URINE B-hCG LEVELS IN CERVICAL CARCINOMA IN RELATION TO HISTOPATHOLOGICAL TYPE

Histopathological Type	serum B-hCG mU/ml		Urine B-hCG mU/ml	
	Range	Mean	Range	Mean
Squamous cell (44 cases)	3.0 - 158	14.3	2.5 - 23.5	5.1
Adenocarcinoma (2 cases)	4.2 - 4.6	4.4	3.5 - 5.3	4.1

in 46 cases of cervical cancer were also analysed in relation to histological grading (Table IV). There was significant increase in serum ß-hCG value in poorly differentiated carcinoma than that in the controls. However, urine ß-hCG did not show rise.

Of the 46 cases of carcinoma cervix, 44 were squamous cell carcinoma and 2 were adenocarcinoma. Serum and urine ß-hCG were compared in these two types (Table V) and interestingly serum ß-hCG level was found higher in squamous cell carcinoma. But this trend was lacking in urine.

COMMENTS

The present study was planned with the aim to find out significance and utility of ß-hCG in serum and urine as a marker for cervical neoplasia. This has become pertinent in view of contradictory reports on this issue. The present study revealed high serum and urine ß-hCG level in Cervical Carcinoma cases.

Higher level of serum ß-hCG was found in only 10 of the 46 cervical cancer cases in our series. However, this was seen in urine sample only in one case. Similar increased ß-hCG in serum in 20-30% of cancer cervix was also reported by Rutanen et al (1978), Donaldson et al (1980) but some investigators like Ayala et al (1983). Das et al (1983), Sheth et al (1981), O'Brien et al (1983) have reported higher levels than found by us. Vladmir et al (1983) found negative hcG in their 42 cases of cervical carcinoma.

The present study revealed higher ß-hcG pattern in early reproductive age group (21-30 years) and Perimenopausal women (41-50 years) Sheth et al (1981) have also reported similar higher ß-hCG in 41-50 years age group of carcinoma cervix cases.

Further our studies have also displayed increasing level of serum B-hCG with higher clinical stage of Cervical Cancer. Fritsche et al (1982), Sheth et al (1981) and Das et al (1983, 1984) have reported similar results.

Another feature of our study was higher serum ß-hCG level in squamous cell carcinoma than adenocarcinoma Corroborating finding of Das et al (1984). Since number of women studied in the present Series is too small, a definite conclusion could not be drawn as regards potentiality of serum ß-hCG as tumor marker of cervical neoplasia.

However ß-hCG was found higher in only one sample of carcinoma cervix and that too in advanced stage IV, hence credibility of serum ß-hCG as marker role remains disputed.

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