SUMMARY AND CONCLUSIONS

Carcinoma of cervix is the most common cancer in women, specially in developing countries. Out of all cases of cancer cervix 75% of cases are in developing and under developed world, where screening facilities are still not available. The disease is responsible for significant number of morbidity and mortality. The desired cancer control has not been achieved by surgical removal or radiotherapeutic sterilization of “localized” masses. Oncologist have come to realize that many tumors that seem localized are in truth microscopically disseminated. Those findings, as well as the plateau reached by local treatment in the cure of cancer cervix has stimulated new conceptual and operational attitudes in the field of cervix cancer staging, monitoring and treatment. New combination
of treatment such as chemotherapy concurrent therapy and radiotherapy can be of great importance in achieving a disease free survival. The chemotherapeutic agents are nephrotoxic and hepatotoxic, whereas radiotherapy is immunosuppressive. The present study was undertaken to estimate the severity of biochemical changes due to toxicity caused by chemotherapeutic agents, radiotherapy and concurrent therapy on renal function, liver function and immunoglobulins of carcinoma cervix patients by undertaking various biochemical tests.

The present study was carried out on 250 patients of cancer cervix. There were 41 (16.4%) patients in group I, who were treated by surgery only and hence were not included in the biochemical studies. All the patients were diagnosed on the basis of cytology / histopathology. The patients were
classified in four groups according to the staging system of International Federation of Gynaecologists and Obstetricians (FIGO). All the patients included in the study were attending the outpatient department of Regional Cancer Centre, Pt.J.N.M.Medical college, Raipur. Fifty normal healthy women without any condition that can affect liver function, hepatic function or immunoglobulins, were included in the study as normal control group.

The 209 patients (250-41=209) were divided into group II, III and IV as follows:-

1. Stage II, IIIa  n=107  (42.8%)
2. Stage IIIb  n=75  (30%)
3. Stage IV  n=27  (10.8%)

Majority of the patients were in the age group of 25-60 years.
The patients of cervical cancer were further divided according to the mode of treatment planned for them i.e. chemotherapy, radiotherapy and combination of both or concurrent therapy.

The biochemical parameters estimated in control subjects and patients of cancer cervix were urea, creatinine, creatinine clearance, glucose, SGPT, SGOT bilirubin, alkaline phosphatase, total protein, albumin, magnesium, calcium, iron, zinc, IgG, IgA and IgM.

The effect of radiotherapy, concurrent therapy and chemotherapy on renal functions, hepatic function and immunoglobulins was studied on the patients of all the four stages of cancer cervix and the control subjects. Minimal changes were observed in the levels of creatinine, creatinine clearance, urea, glucose, bilirubin, alkaline
phosphatase, SGOT, SGPT, total protein, albumin, magnesium, calcium, iron, zinc, IgG, IgA, and IgM. Age of controls and patients did not make difference in the levels of these parameters.

Patients receiving only radiotherapy after surgery of stage II and IIIa were grouped together (n = 107, 42.8%). Patients of this group showed significant increase in serum creatinine (p<0.01), serum urea (p<0.05), alkaline phosphatase (p<0.01), and SGPT (p<0.05). Serum creatinine clearance showed significant decrease (p<0.01). These figures after one month had similar trends, though to a smaller scale, raised serum creatinine (p<0.05), alkaline phosphatase (p<0.05) and fall in serum creatinine clearance (p<0.05). Hypomagnesaemia and hypocalcaemia was also observed during radiotherapy which reverted to normal after one month.
The immunoglobulins, specially IgG and IgA were raised (p<0.001) at baseline and remained somewhat raised during radiotherapy (p<0.01). These elevations returned to normal and remained normal after 3, 6 and 9 months. Serum IgM was unchanged throughout the period.

It can be inferred by the study that radiotherapy mainly causes nephrotoxicity. The effects on liver functions and immunoglobulins, though evident, are much less.

There were 75 (30%) cases of stage IIIb cervical cancer and they received concurrent therapy. This group showed increase in serum creatinine (p<0.01), serum urea (p<0.01), serum bilirubin (p<0.01), SGPT (p<0.01) and SGOT (p<0.05). Serum creatinine clearance was reduced (p<0.01) during therapy. These changed levels reverted to normal after one month.
Serum glucose, total protein, albumin, iron and zinc did not show significant changes throughout the study period. However, serum magnesium and calcium levels showed significant decline (p<0.05). Hypomagnesaemia and hypocalcaemia returned to normal levels after one month.

Serum Immunoglobulins IgG and IgA were raised markedly (p<0.001) at baseline and remained elevated during therapy (p<0.01). They returned to normal after one month and remained same after 3, 6 and 9 months. IgM levels were static throughout the study period.

This study denotes that radiotherapy alone or in combination with chemotherapy affects kidneys and liver equally and that the effects are transient and reversible.
All the 27 (10.8%) patients of stage IV cancer cervix received chemotherapy. They showed significant elevation in the serum levels of creatinine (p<0.001), urea (p<0.001), bilirubin (p<0.001), alkaline phosphatase (p<0.001), SGPT (p<0.001) and SGOT (p<0.001). Serum creatinine clearance was significantly decreased (p<0.001). Serum magnesium (p<0.001) and serum calcium (p<0.001) were also decreased. After a period of one month of chemotherapy, serum creatinine, urea, SGPT, SGOT, magnesium and calcium levels were still higher than normal (p<0.01) and after three months all parameters returned to normal level except serum urea, bilirubin and alkaline phosphatase, which were still raised (p<0.005). They touched the normal level by end of six months of chemotherapy.
Serum total protein, albumin, glucose, and zinc did not show any change throughout the study period. Serum iron level also did not show significant change.

Serum IgG and IgA levels were raised at baseline (p<0.001) significantly and remained significant (p<0.01 during chemotherapy. As the treatment continued, these levels started declining but were higher than normal even after nine months of therapy in some of the cases.

The present study shows that chemotherapy causes more toxicity than radiotherapy. As compared to radiotherapy, the patients having chemotherapy showed higher degree of renal and hepatic involvement. These observations, however, need further studies, to confirm the findings.
It can be concluded after the study, that radiotherapy along with chemotherapy is reasonably well tolerated, without permanently affecting the renal and hepatic functions. The immunoglobulins, specially IgG and IgA can be used as clinical and prognostic tools to evaluate the success of treatment.