

## Renal Status of Patients with Cervical Cancer Prior to Treatment Commencement

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### ABSTRACT

The renal system is one of the body organs that are affected in advanced carcinoma of the cervix uteri. The aim of this study is to see the pattern and the prevalence of renal impairments seen in patients with cervical cancer presenting in our clinic prior to treatment.

One hundred and ninety nine consecutive patients with histological proven carcinoma of the uterine cervix who were referred to the Radiotherapy Department were enrolled in the study. All the patients had FIGO staging. Measurements of blood urea and creatinine and abdominopelvic ultrasound scan were done to assess their renal status.

Most of the patients (71.9%) were aged 50yrs and above. 116 (54%) presented at stages 3 and 4. In addition, 53 patients (26.9%) and 61 (26.2%) have raised blood urea and creatinine levels above normal respectively, whereas ultrasound scan abnormalities i.e. hydronephrosis and or hydrocalycosis were seen in 66 (33.2%), 26 (13.1%) had hydroureters and evidence of renal parenchymal disease were seen only in 19(9.5%).

Renal impairment was seen in more than a quarter of patients presenting with cancer of the cervix prior to treatment commencement. Renal assessment should therefore be an important pre-treatment work-up for all patients with cancer of the uterine cervix.

**Keywords:** *Renal impairment, cervical cancer*

### INTRODUCTION

Cervical cancer is the second most common malignancy in women worldwide, and it remains a leading cause of cancer-related death for women in developing countries. In the United States, it is the fourth most common malignant neoplasm in women, after carcinoma of the breast, colorectum, and endometrium [1]. The incidence of invasive cervical cancer has declined steadily in the United States over the past few decades. However, it continues to rise in many developing countries. The change in the epidemiological trend in the United States has been attributed to mass screening with Pap smears [2]. In Nigeria, cancer of the cervix is second only to cancer of the breast as seen in University College hospital, Ibadan [3,4].

The renal system is one of the first body systems to be directly affected by cancer of the cervix especially in advanced cases. Indeed renal involvement is regarded as a staging sign post in cervical cancer and patients with evidence of renal impairment as a result of cancer of the cervix are said to have stage 3b disease [5]. Unfortunately, most of our patients in Nigeria present at late stages and often have evidence of renal impairment at presentation [5]. Renal involvement also worsens the overall prognosis [6,7].

The aim of the present study is to characterise the prevalence and the pattern of renal impairment present in cervical cancer patients presenting at our department for the first time prior to treatment

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commencement. This is to see how this compares to findings in many previous studies done on the subject.

**MATERIALS AND METHOD**

One hundred and ninety nine consecutive patients with histological diagnosis of carcinoma of the uterine cervix were recruited for the study. One hundred and ninety three 193 patients had FIGO staging during examination under general anaesthesia.

All patients had their blood urea and creatinine measured to assess their renal status. They also had pelvic ultrasound to assess the state of their kidneys. Hydronephrosis, hydrocalycosis, hydroureters and evidence of renal parenchyma disease on ultrasound scanning were used to determine the state of the patients’ renal system. All patients with previously diagnosed hypertensive disorders and diabetes were excluded. None of the included patients volunteered any family history of chronic kidney disease

The collected data was analyzed with SPSS statistical programme for Mac OS X, version 16 and presented in tabular and chart form.

Biomedical values were obtained from the University College Hospital (UCH) Ibadan, laboratories and the laboratories’ normal reference values were used to determine the presence or absence of renal impairment. Creatinine levels above 1.5mg/100ml, urea levels above 45mg/100ml and the presence of Hydronephrosis, hydrocalycosis, hydroureters and renal parenchyma disease on ultrasound were used as indicators of renal impairment.

Patients’ bio data including the age were also noted. A brief review of relevant literature was also done

**RESULTS**

All the 199 patients’ records concerning the age and the ultrasound assessment were available for analysis. However only 187 patients had records of their creatinine levels, while 197 had blood urea level records available for analysis. The missing laboratory values were due to logistic reasons including clotted samples and power failure.

The patients’ ages ranged from 31 years to 90 years with a mean age of 56.53. Most of the patient (71.9%) were 50 years and above while only 9% were below 40 years.

Only 193 of the patients had staging information available. One patient presented with stage 0 (She

was diagnosed following a routine pap smear examination). Nine patients (7.3%) were in stages 1 (a and b) , 74 patients (38.3%) presented with stages 2 (a and b) while the remaining 116 (54.4%) presented at stages 3 and 4.

**Renal Status**

66 of the 199 patients (33.2%) had evidence of Hydronephrosis and or hydrocalycosis, 26 (13.1%) had hydroureters while only 19 (9.5%) had evidence of renal parenchyma disease. (Tables 1)

The result is slightly different when we analysed for patients with stages 3 and 4 only. Table 2

**Table 1:** Ultrasound evidence of renal impairment

Variable	Hydronephrosis and Hydrocalycosis	Hydroureter	Renal Parenchymal Disease
Present (%)	33.2	13.1	10.1
Absent (%)	66.8	86.9	89.9

Urea levels were within normal limits of 45 and below in 144 (73.1%) of the 197 patients . However, 53

**Table 2:** Ultrasound evidence of renal impairment in patients in stages 3 and 4

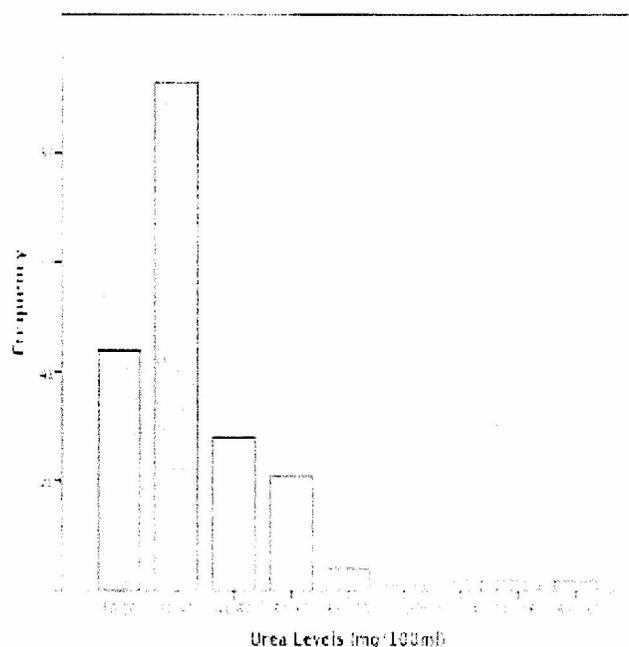
Variable	Hydronephrosis and Hydrocalycosis	Hydroureter	Renal Parenchymal Disease
Present (%)	50.5	22.9	18.1
Absent (%)	49.5	77.1	81.9

**Table 3:** Creatinine levels in the patients

Creatinine Levels (mg/dl)	Frequency (%)
1.5 and below	73.8
1.6-2.5	9.6
2.6-5.5	10.7
5.6-10	5.3
Above 10	0.5

(26.9%) had urea levels above normal values. (Figure 1)

Fig. 1: Bar Chart Showing Urea Levels in the Patients



Also 138 (73.8%) of 187 patients had creatinine levels of 1.5mg/100ml and below. The rest have raised levels of 1.6mg/100ml and above. (Table 3)

### DISCUSSION

The uterus is a pelvic organ. It comprises of the uterine body and the uterine cervix, which is the lower one third that enters the vagina. The uterine cervix is closely related to pelvic ureters which run close to its lateral margins [8]. Cervical carcinoma spreads predominantly by direct invasion and lymphatic permeation. Direct spread is superiorly into the body of the uterus, inferiorly into vaginal mucosa and laterally to the parametrium and pelvic sidewalls as well as the ureters [9].

The urinary system is the principal organ system responsible for water and electrolyte homeostasis. It provides the mechanism by which excess water and electrolytes are eliminated from the body. It also excretes toxic metabolic waste products. The end products of these processes being urine production [10]. In addition, detoxification and elimination of drugs, control of red blood cell mass through production of erythropoietin, endocrine control of

mineral metabolism, and maintenance of acid base balance are other important functions of the kidneys [11].

Many studies have shown that the presence of renal impairment in patients with carcinoma of the cervix is a poor prognostic indicator [6]. Patient with evidence of renal impairment relating to the cervical cancer are said to be stage 3b according to the widely used International Federation of Obstetrics and Gynaecology (FIGO) staging for cancer of the uterine cervix [12].

Michael *et al.* reviewed prognostic factors for advanced squamous cell cancer of the cervix and reported that 29% of patients have ureteral obstruction. A similar study carried out in this centre by Komolafe *et al.* showed that obstructive urographic changes were present in 46% of cases of histologically diagnosed cervical cancer. This is three times higher than the value seen in Caucasian population [14].

Frohlich *et al* have shown the usefulness of ultrasonography in the diagnosis of ureteral obstruction that occurs in cervical cancer patients. He established that ultrasound is as sensitive as intravenous pyelography in detecting ureteral obstruction [15]. The use of ultrasound has also been advocated as it has higher resolution than intravenous pyelography. Pyelography on the other hand is superior to ultrasonography since it offers greater evidence about the functional state of the kidney. However, cost and the non-invasive nature of ultrasonography are important considerations in our environment [16].

There are many non-malignancy related causes of renal impairment in patients. These include uncontrolled hypertension, diabetes mellitus etc. These were excluded in the patients that we studied [17]. Our results showed that up to 30% or close to one third of all patients presenting with cancer of the uterine cervix have evidence of impaired renal functions. This figure increased to more than 50% in patients with diseases in stage 3 and above.

As earlier indicated, the kidney is important in the production of red blood cells. Red blood cells are important in making molecular oxygen available to all parts of the body including the tumour. Radiobiological evidence has shown that tumour cells that are poorly oxygenated are more resistant to the effect of radiation therapy [18]. It is therefore obvious that in addition to the problem associated with renal insufficiency, cervical cancer patient with renal

impairment are likely to have poorer outcome from radiation treatment due to potential radioresistance from reduced oxygen in the system.

### CONCLUSION

Our study, in line with some previous works on the subject has demonstrated high proportion of patients with renal impairment among people presenting with cancer of the cervix in our clinic. We therefore recommend that all patients presenting with cervical cancer should have renal assessment done with ultrasonography, electrolyte, urea and creatinine estimations and where significant renal insufficiency is demonstrated, renal consultation should be requested prior to treatment commencement.

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