INTRODUCTION

Renal cell carcinoma (RCC) represents 2-3% of all cancers1. Renal cell carcinoma is the commonest solid lesion within the kidney and represents 90% of all kidney malignancy2. There is a 1.5:1 predominance of men over women, with peak incidence occurring between 60 and 70 years of age3-7. Risk factors include lifestyle factors such as smoking, obesity, patients who have a first-degree relative with kidney cancer are also associated with an increased risk of RCC8-9.

Many renal masses are asymptomatic and non-palpable until the late stages of the disease10. Currently, more than 50% of RCCs are detected incidentally by using imaging to investigate a variety of non-specific symptom complexes11-13. The classic triad of flank pain, gross hematuria, and palpable abdominal mass constitute only 6-10% cases14, 15. A few patients present with symptoms due to metastatic disease, such as bone pain or persistent cough16.

The most commonly assessed laboratory parameters are serum creatinine, glomerular filtration rate, haemoglobin, erythrocyte sedimentation rate, alkaline phosphatase, lactate dehydrogenase (LDH), and serum corrected calcium17 18. Most renal tumors are diagnosed by abdominal ultrasound or CT performed for various reasons. Imaging must be performed both before and after administration of intravenous contrast material to demonstrate enhancement. A change of 20 HU or greater is a strong evidence of enhancement19. There

ABSTRACT

Objective: To study the pattern of presentation of patients with renal cell carcinoma.

Methodology: This descriptive study was conducted at Institute of Kidney Diseases, Hayatabad Medical Complex Peshawar-Pakistan from January to December 2012. All patients who were diagnosed as renal masses on ultrasound were admitted. Detailed history and physical examination was performed on all patients. Relevant investigations were done on all patients.

Results: A total of 65 patients with renal cell carcinoma were included in the study. Patients presented with flank pain (n=30, 46%); hematuria (n=14, 22%); flank mass (n=2, 3%); both hematuria and flank pain (n=3, 5%); incidental tumors (n=10, 15%); and with metastasis (n=6, 9%). The tumors were located on right side in 39 (60%) cases and 26 (40%) on left side with 80% of the tumors involving the upper pole of the kidney. Twenty six patients (40%) were cigarette smokers. No patient was found to have positive family history of renal cell carcinoma or any other cancer in the close family. Fifty nine patients with renal tumors underwent radical nephrectomy and histopathology was done of every specimen. In six patients of renal tumor with metastasis, needle biopsy was taken. The histopathology of the specimen showed that 61 (94%) were clear cell type and 4 (6%) were papillary cell carcinoma.

Conclusion: Renal cell carcinoma presents with a variety of symptoms. It can also present incidentally during investigation for non-specific symptoms. Ultrasonography is encouraged for nonspecific abdominal symptoms to detect renal cell carcinoma at earlier stage.

Key Words: Renal cell carcinoma, Hematuria, Flank pain, Flank mass, Incidental tumors, Metastasis.
is a consensus that most bone and brain metastases are symptomatic at diagnosis so that a routine bone or brain CT scan is not generally indicated. However, if indicated by clinical or laboratory signs and symptoms, other diagnostic procedures may be used, such as a bone scan, brain CT or MRI.

Renal cell cancer is a treatable disease if it is diagnosed in early stage (T1, T2). Most of these patients are non-symptomatic in early stage of the disease. These patients can only be diagnosed by imaging like ultrasound which is easily accessible, everywhere available, and cheap also. If the ultrasound is done on every patient presenting with specific and non-specific symptoms in urology outpatient department, we can catch the Renal Cell Carcinoma in early stages (T1, T2). This study was thus conducted to report pattern of presentation of renal cell carcinoma at Institute of Kidney Diseases, Peshawar, Pakistan.

**METHODOLOGY**

This descriptive study was conducted at Institute of Kidney Diseases Hayatabad Medical Complex Peshawar from January to December 2012. All patients who were included in the study presented to Out Patient Department or Emergency department of Institute of Kidney Diseases with flank pain, hematuria and renal mass. These were further investigated with routine laboratory investigation and imaging. The patients who were diagnosed as having renal tumors were included in the study. The data collection was done through consecutive sampling technique. Ultrasounds were done on all patients in the Out Patient Department. All patients with renal masses were admitted in the urology ward. Detailed history including symptoms, smoking history, family history and occupational history was taken and physical examination was performed on all patients. Investigations including urine analysis, complete blood counts, renal function tests, alkaline phosphatase, Lactate Dehydrogenase, serum electrolytes including serum calcium, x-ray chest and computerized tomography with intravenous contrast were done on all patients. After preoperative preparation, 59 patients with renal tumors underwent radical nephrectomy and excision biopsy of each was sent for histopathology. All these patients underwent uneventful surgery. In 6 patients who presented with metastatic tumors which were non-operable had only biopsy done to get the histopathology and were referred to oncologist for further treatment. All the data was collected on a predesigned proforma.

**RESULTS**

In our study, 65 patients were identified as having renal masses. This included 60 male (93%) and 5 female (7%) patients. The mean age of the sample was 49.2±20 years. Most of our patients were in their 5th decade of life. Most patients presented with flank pain (n=30, 46%), followed by hematuria (n=14, 22%) (Figure 1). Only 10 (15%) patients were identified as having incidental tumors and 6 (9%) patients presented with metastasis. The tumors were located on right side in 39 (60%) cases and left side in 26 (40%) cases, with 52 (80%) tumors involving the upper pole and 13 (20%) tumors involving the lower pole of the kidney on computerized tomography. Among them 26 (40%) patients had positive history of cigarettes smoking. No patients were found to have positive family history of renal cell carcinoma or any other cancer in the family. All the tu-

![Figure 1: Presentation of renal tumor](image-url)
tumors came out to be renal cell carcinoma, with 61 (94%) patients diagnosed as clear cell type and 4 (6%) patients as papillary cell carcinoma.

**DISCUSSION**

Renal cell carcinoma is a common urological malignancy presenting with variety of symptoms like hematuria (50-60%), flank pain (40%), palpable mass (30%) and both hematuria and flank pain (in less than 10% cases) as reported by Motzer et al.24 According to Greenberg et al, Renal cell carcinoma presents with hematuria (40%), flank pain (40%), palpable mass (25%), weight loss (33%), fever (20%), Hypertension (20%), metastasis (30%) and in 10% cases as classic triad of haematuria, flank pain and flank mass.25 In our study the renal mass presentation was flank pain (46%), hematuria (22%), flank mass (3%), (hematuria and flank pain) 5% incidental tumors 15%, and metastasis (9%). It can present with Para neoplastic manifestations including hypercalcemia, polycythemia, hepatic dysfunction and amyloidosis in 20% of cases24, 26-28. Renal cell carcinoma can also present with atypical symptoms like hoarseness and calveral metastasis,29, 30 cardiac metastasis,31, monoarthritis32, pancreatitis33, life threatening poly neuropathy34, poly myalgia rheumatica35 and gastrointestinal bleeding36. Hypercalcemia is the most common paraneoplastic complication of renal cell carcinoma, and approximately 17% of all patients with renal cell carcinoma develop hypercalcemia during the course of their disease37-39. Of patients with known malignancy who develop hypercalcemia, the most common malignancies are of lung and kidney40, 41. It can present with loco regional and distant metastasis in up to 25% of cases. In our study we found 9% patients presented with metastasis with raised alkaline phosphatase and LDH.

Symptomatic presentation correlates with aggressive histology and advanced disease. The mode of presentation can independently predict an adverse patient outcome. Indicators of symptomatic presentations include flank pain, flank mass, varicocele, constitutional symptoms. Para neoplastic syndromes and bone pain are related to metastatic disease42. Preoperative clinical variables may be used instead of the pathologic stage to determine the risk of recurrence43. In our study we also found that the symptomatic patients like pain, hematuria and associated paraneoplastic syndrome patients were of high stage tumor patients.

Today, most tumors are diagnosed incidentally44. Due to increased use of noninvasive radiological modalities like ultrasound and computerized tomography, there is increased frequency of detecting incidental renal cell carcinoma accounting of 25-40% cases in developed countries. The incidental tumors are usually smaller in size and are of lower stage (T1, T2) as compared to symptomatic tumors and are more amenable to nephron sparing surgery with less postoperative morbidity and better survival outcome. In our study the frequency of incidental renal tumors were (15%) which were detected through ultrasonography and CT scan advised for non specific complaints.

Our results do not match the presentation pattern of renal cell carcinoma seen in other studies. Most of our patients were in the 40th decade although patients in their sixties and seventies with renal cell carcinoma were also seen. Patients in our study are younger as compared to the other studies44. There is very low incidence of incidental tumors in this study. Most of our patients were symptomatic and flank pain was the most common presenting symptom as opposed to Greenberg et al, where hematuria was the most common presenting complaint45. Reasons for these discrepancies may be due to that most of our patients were referred patients. Because of low level of education and lack of health awareness among the people in this region they usually ignore the warning signs like an episode of hematuria and present late to the hospital after they develop other symptoms like flank pain. Another reason for low number of incidental tumors in our study may have been the non availability of expert sonologist and radiological facilities in our peripheral catchment areas for our tertiary care kidney center. The male to female ratio for the renal cell carcinoma is 1.5:1 but in our study this ratio is 10:1. This may be because of less number of female patients presenting to the hospital because of cultural trends and lack of health awareness amongst the females in this region.

**CONCLUSION**

Renal cell carcinoma presents with a variety of symptoms like flank pain, hematuria and renal mass. It can also present incidentally during the investigation for non-specific symptoms. Symptomatic tumors are usually at advanced stage whereas the incidental tumors are smaller and of lower stage (T1, T2). In our study, relatively younger population was noted to have RCC. Due to that most of our patients were referred patients. Because of low level of education and lack of health awareness among the people in this region they usually ignore the warning signs like an episode of hematuria and present late to the hospital after they develop other symptoms like flank pain. Another reason for low number of incidental tumors in our study may have been the non availability of expert sonologist and radiological facilities in our peripheral catchment areas for our tertiary care kidney center. The male to female ratio for the renal cell carcinoma is 1.5:1 but in our study this ratio is 10:1. This may be because of less number of female patients presenting to the hospital because of cultural trends and lack of health awareness amongst the females in this region.

**REFERENCES**

2. Kovacs G, Akhtar M, Beckwith BJ, Bugert P, Cooper CS,


CONTRIBUTORS

MN planned the study, did data analysis and wrote the manuscript. MKK, HU, MIK, IA and AK helped in data collection and manuscript writing. All authors contributed significantly to the final manuscript.