

PROFILE OF PATIENTS UTILIZING MAGNETIC
RESONANCE IMAGING (MRI) AND COMPUTERIZED
TOMOGRAPHY (CT) SCAN FACILITY IN A LARGE
TERTIARY CARE TEACHING HOSPITAL IN NORTH INDIA

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Abstract

Background: Radio diagnosis and Imaging department is an important department of a hospital that contributes directly to patient care by providing diagnostic support to all the specialties. The study was conducted to study the profile of patients utilizing MRI and CT scan facility in a large tertiary care teaching hospital. **Material and method:** A prospective study of one-year duration was carried out to study the profile of patients using MRI and CT scan facility at Sher-i-Kashmir Institute of Medical Sciences, Srinagar (J&K) India. **Results:** A total of 7171 number of patients were studied for utilization of MRI (1282) and CT scan (5889) facility at Sher-i-Kashmir Institute of Medical Sciences, Srinagar. The highest (60.4%) numbers of CT Scans were done for scanning head which highlights the importance of CT scan machine. It was observed that most of scans (72.1% CT Abdomen, 82.9% CT Chest, and 80% MRI scans were with positive finding.

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Conclusion: It was observed that most MRI and CT scans were with positive finding which indicated that CT scan and MRI are useful tools of investigations in a tertiary care hospital.

Key words: CT scan, MRI scan, utilization, Patient Profile.

Key Message: CT & MRI scans are important diagnostic tools in Accident & Emergency department of a tertiary care institute.

Introduction

Hospital utilization denotes the manner in which a community makes use of its hospital resources [1]. The organizational components such as goal, structure and technology are very important in deciding the utilization pattern of health services [2]. The role played by the hospital in community can be fully studied only by taking into consideration all the aspects of hospital services including inpatients, ambulatory, domiciliary, preventive medicine and health education. Hospitals in developing countries like India are unable to utilize resources in an efficient manner. Professionalism is the need of the hour in order to improve efficiency in hospitals [3]. Radio diagnosis and Imaging department is an important department of the hospitals, contributing directly to patient care by providing diagnostic support to all the specialities which cannot practice efficiently without this department's support [4]. The importance of imaging modality of investigation has assumed great significance in the past two decades [5]. Newer imaging technologies like CT and MRI scan are replacing the older ones in the evaluation of patients. The impact of this change would be useful in justifying the increase in the use of these new technologies and decreasing their inappropriate use which should be done on priority basis in efforts that focus on controlling imaging expenditure [6]. The objective of the study was to study

the patient profile in CT scan and MRI investigations so that imaging technologies like CT and MRI scan can be used in an effective and efficient manner.

Material and method

A prospective study of one year duration from 1st January to 31st December 2009 was undertaken in the CT and MRI section of the department of Radio diagnosis at Sher-i-Kashmir Institute of Medical Sciences, Srinagar. The data was collected daily from records of CT and MRI sections of the department of Radio diagnosis using predesigned proforma. To standardize the proforma a pilot study of two weeks was undertaken before the actual study was done. By a systematic random sampling method, every third patient who was advised CT or MRI scan was taken for study. Patients were studied across speciality, dwelling, gender, and the findings of scan. The data thus obtained was compiled, analyzed, and conclusions were drawn regarding the objective.

Results

Patient profile in scanning: A total of 7171 scans were studied during the one year. Of all scans CT head, CT abdomen, CT chest and MRI constituted 50%, 15%, 17%, and 18% respectively (**Figure 1**).

Patient profile in CT scan head: A total of 3556 CT scan head were studied out of which 3246 most (91.3%) CT scans were prescribed from Accident & Emergency department, 220 (6.2%) from wards and 90 (2.5%) from OPD (**Table 1**). Out of 3556 patients undergoing CT scan head approximately two-third (64.3%) was males and one third (35.7%) were females (**Table 2**). Almost two-third (64.7%) of the patients undergoing CT scan head were from rural background and only one third (35.3%) were from urban background (**Table 3**). Most (62.8%) of the CT scan

head prescribed were normal and only approximately one third (37.2%) of the CT scan head showed positive findings (**Table 4**).

Patient profile in CT scan abdomen: The CT scans of the abdomen constituted only 18.3% of the total CT scans done in the department of radio diagnosis and imaging at Sher-i-Kashmir Institute of Medical Sciences, Srinagar. The maximum (78.9%) number of patients was those who are admitted in the wards (**Table 1**). Out of all the patients undergoing CT scan abdomen 54.3% were females and 45.7% were males (**Table 2**). Most (58.2%) of the patients undergoing CT scan abdomen were from rural background and only 41.8% belonged to urban area (**Table 3**). Positive CT scan findings were found in most (72.1%) of the patients who were prescribed CT scan abdomen with only 27.9% of the patients CT scan abdomen showed normal findings (**Table 4**).

Patient profile in CT scan chest: The CT scans of the chest consisted of only 21.3% of the total CT scans done in the department of radio diagnosis and imaging at Sher-i-Kashmir Institute of Medical Sciences, Srinagar. The majority (76.1%) of patients undergoing CT scan chest belonged to inpatients department (wards) (**Table 1**). Out of all the patients undergoing CT scan chest the gender wise distribution was 54.1% males and 45.9% females (**Table 2**). Also 55.6% of the patients undergoing CT chest belonged to rural area and 44.4% belonged to urban area (**Table 3**). Most (82.9%) of the patients who were advised CT scan chest were found with positive findings on scan and only 17.1% of the patients advised CT scan head showed normal findings (**Table 4**).

Patient profile in MRI scans: None of the MRI scans were ordered from OPD and most (85.5%) of the patients advised MRI scans were from inpatient area (**Table 1**). There were

53.2% females and 46.8% females undergoing MRI scan (**Table 2**). Majority (62.4%) of the patients undergoing MRI scan belonged to rural area with some (37.6%) belonging to urban area (**Table 3**). Again, eighty percents (80%) of the patients who were advised MRI scans were found to have positive findings with only small number (20%) having normal findings (**Table 4**).

Discussion

The study undertaken with the objective to study patient profile revealed that the most of the patients (91.3%) undergoing CT scan head were from Accident & Emergency department of the hospital which highlights the importance of CT scan facility in Accident & Emergency department of the hospital of a tertiary care institute. This shows that there is perceived need for diagnostic certainty as well as for medico-legal purpose. The positive findings on CT scan chest (82.9%), abdomen (72.1%) and MRI (80%) indicate that CT chest, CT abdomen and MRI are useful diagnostic tools in tertiary care hospital.

Conclusion

Although CT & MRI scan facility is costly, this study highlights the importance and necessity of having CT & MRI scan facility in Accident & Emergency department of a tertiary care institute as useful diagnostic tools.

References

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Table 1: Patient Profile in CT and MRI scan at SKIMS across area

Area	CT head		CT abdomen		CT chest		MRI scan		Total	
	n	%	n	%	n	%	n	%	n	%
A&E	246	1.3	100	9.3	150	11.9	00	0.0	3496	48.8
Wards	220	6.2	850	78.9	956	76.1	1096	85.5	3122	43.5
OPD	90	2.5	127	11.8	150	11.9	186	14.5	553	7.7
Total	3556	100	1077	100	1256	100	1282	100	7171	100

Table 2: Patient Profile in CT and MRI scan at SKIMS across gender

Gender	CT head		CT abdomen		CT chest		MRI scan		Total	
	n	%	n	%	n	%	n	%	n	%
Male	2288	64.3	585	54.3	680	54.1	600	46.8	4153	57.9
Female	1268	35.7	492	45.7	576	45.9	682	53.2	3018	42.1
Total	3556	100	1077	100	1256	100	282	100	7171	100

Table 3: Patient Profile in CT and MRI scan at SKIMS across dwellings

Dwelling	CT head		CT abdomen		CT chest		MRI scan		Total	
	n	%	n	%	n	%	n	%	n	%
Rural	2300	64.7	627	58.2	698	55.6	800	62.4	4425	61.7
Urban	1256	35.3	450	41.8	558	44.4	482	37.6	2746	38.3
Total	3556	100	1077	100	1256	100	1282	100	7171	100

Table 4: Patient Profile in CT and MRI scan at SKIMS across findings.

Findings	CT head		CT abdomen		CT chest		MRI scan		Total	
	n	%	n	%	n	%	n	%	n	%
Positive	1323	37.2	777	72.1	1941	82.9	1026	80	4167	58.1
Normal	2233	62.8	300	27.9	215	17.1	256	20	3004	41.9
Total	3556	100	1077	100	1256	100	1282	100	7171	100

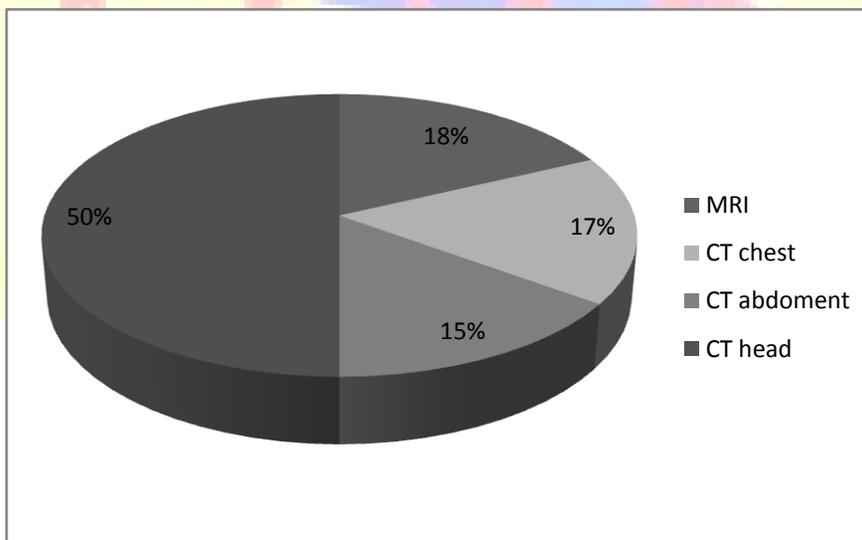


Figure 1. Patient profile in CT and MRI at SKIMS