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Original article

Sociodemographic characteristics and referral pattern of the patients who have undergone CT scan at National Institute of Mental Health & Hospital, Dhaka

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Abstract

Background: Sociodemographic status and utilization of diagnostic healthcare facilities are important parameters to consider to ensure equitable distribution of healthcare services.

Objectives: To assess the sociodemographic characteristics and referral pattern of the patients who have undergone CT scan at National Institute of Mental Health & Hospital (NIMH), Dhaka.

Methods: This observational study was carried out during the period of March 2019 to September 2019 and 475 clients were consecutively enrolled. Sociodemographic and relevant data were collected by a semi-structured questionnaire.

Results: Mean age of the participants was 40.3±16 years; 42.5% of them were female and 57.5% male. For majority of them requests were for the brain CT scan (47.6%) followed by CT KUB (23.8%), whole abdomen (19%) and CT urogram (9.5%). Among the referred patients, 50.1% were referred from NIMH, 42.5% were referred from NIKDU, 4.8% were directly referred from physicians and 2.5% were referred from BSMMU. Patients came from urban locality were 47.5% whereas 52.4% patients were from rural areas. Majority of the patients were married (77.4%). More than half of the patients (60%) were not involved with any sort of income generation.

Conclusions: This study depicts some of the important sociodemographic contents of the patients undergoing CT scan along with the referral pattern, which requires further research and monitoring to obtain better understanding about the current utilization pattern of CT scanning.

Declaration of interest: None

Keywords: CT scan; referral pattern

Introduction

In today's world imaging technology is one of the most important diagnostic approaches involved in the process of treatment and following up the prognosis. The modern imaging technologies are constantly supplanting the older ones. One of the most utilized modern imaging techniques is computed tomography scan (CT scan). CT scan is a radiation based noninvasive diagnostic imaging technique, that uses computer processed combinations of ionizing radiation of X-rays, directed from multiple angles to produce a cross-sectional images of the body, allowing for to perceive the tissue and organs of the body based on their ability to absorb the X-ray beam.[1,3] Since the beginning of its medical utilization from the early 1970, it has remained a popular method of choice in the diagnostic field because of its enhanced aptitude of distinguishing tissues and organs.[4] CT scan has been used to differentiate abnormal body mass and pathological alterations, also, it is widely used for the screening of various diseases.[5]

While modern diagnostic technologies have made it faster and easier to depict the underlying pathological etiology thus improved the quality of healthcare obtainability, alongside it has also increased the healthcare expenditure and posed as a challenge for developing countries like ours where resources are limited.[2,6,7] Sociodemographic disparities in obtaining health care provision is well recognized across all over the world and apparent among all groups.[4,8] Moreover, people with low socio-economic background have shown more episodes of hospital consultation and diagnostic and medical procedures utilization.[4,9] Extensive evaluation of the distribution and utilization of these high-tech and expensive diagnostic procedures

like CT scan, is required to ensure adequate dissemination of healthcare resource allocation, which have not been sufficiently studied in our country. Therefore, the present study has aimed to evaluate the sociodemographic characteristics and referral pattern of the patients who have undergone CT scan at a tertiary level hospital in Dhaka city where patients come from all over Bangladesh and to provide insight about the current situation which will guide to carry out further future assessment on this area to find out the scopes of improvement and intervention.

Methods

It was a descriptive type of observational study conducted in the Department of Radiology and Imaging of National Institute of Mental Health & Hospital (NIMH) during the period of March 2019 to September 2019. During this period, all the radiology request forms, referred to the respective department were checked and 475 consecutive forms requesting for CT scan had been evaluated for the study purpose.

Data regarding sociodemographic background including, age, sex, occupational status, marital status and residency had been recorded. The referring sources were divided into 4 groups, National Institute of Mental Health & Hospital (NIMH), National Institute of Kidney Diseases & Urology (NIKDU), Bangabandhu Sheikh Mujib Medical University (BSMMU) and individual physicians. The requested CT scans were divided into 4 groups, CT scan of brain, CT scan of whole abdomen (CT-W/A), CT scan of kidneys and bladder (CT-KUB) and CT urogram. All statistical analyses were carried out using the SPSS (Statistical Package for the Social Sciences) version 25 software. Data are presented as frequency and percentages for categorical data and mean and standard deviation for continuous data.

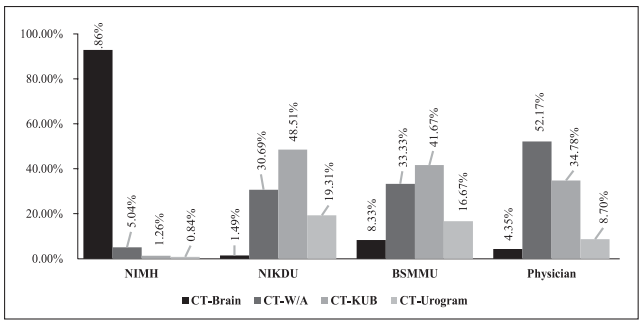
Results

Among the 475 participants of the study, CT scan of the brain was requested by 226 (47.5%) patients, CT scan of the whole abdomen by 90 (18.9%) patients, CT-KUB by 114 (24%) patients and CT urogram by 45 (9.4%) patients. Patients who were from the NIMH was highest in fraction (50.1%), followed by NIKDU (42.5%), then directly referred from physicians (4.8%) and BSMMU (2.5%). The mean age of the study participants was 40.3 ±16 years and the age range were between 15 to 77 years. The age distribution of the patients showed that, 95 (20%) patients were aged 25 years or below, 131 (27.5%) patients were aged between 26 to 35 years, 95 (20%) patients aged between 36 to 45 years, 71 (15%) patients were aged between 46 to 55 years and 83 (17.5%) patients were aged 56 years or above. Among them 274 (57.6%) participants were male and 20 (42.3%) participants were female. Residence wise 226 (47.5%) patients came from urban areas whereas 249 (52.42%) patients from rural areas. Majority of the patients were married (77.4%). More than half of the patients (60%) were not involved in any sort of income generation activity, among them 29.8% patients were housewives, 12.6% patients were students and 17.4% were unemployed (Table 1).

Table 1: Types of CT scan and sociodemographic characteristics of the patients (N=475)

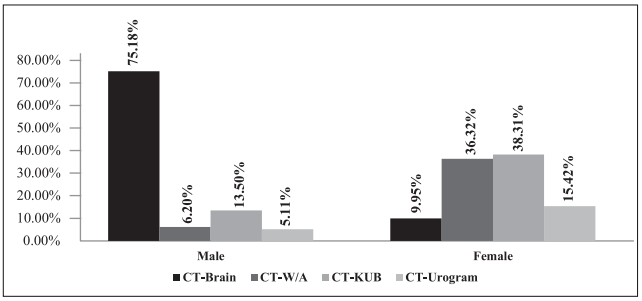
Characteristic		Frequency (n)	Percentage (%)
Type of CT scan	Brain	226	47.5
	W/A	90	18.9
	KUB	114	24
	Urogram	45	9.4
Referred from	NIMH	238	50.1
	NIKDU	202	42.5
	BSMMU	12	2.5
	Physician	23	4.8
Age (year)	≤25	95	20
	26-35	131	27.5
	36-45	95	20
	46-55	71	15
	≥56	83	17.5
Gender distribution	Male	274	57.6
	Female	201	42.3
Residency	Urban	226	47.5
	Rural	249	52.4
Occupational status	Service holder	36	7.5
	Business	59	12.4
	Labor job	83	17.4
	Garments worker	12	2.5
	Housewife	142	29.8
	Unemployed	83	17.4
	Student	60	12.6
Marital status	Unmarried	107	22.5
	Married	368	77.4

Figure 1: Types of CT scans requested according to their source of referral (N=475)



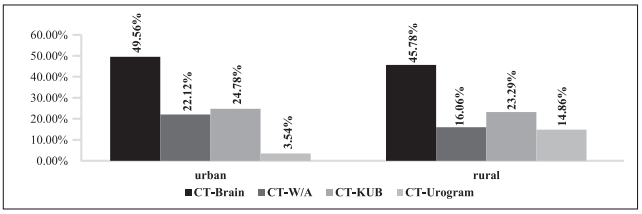
Distribution of requests for CT scans showed that, 92.8% of the scans from NIMH were for brain CT scans. Patients who were referred from NIKDU and BSMMU, requested for CT-KUB in highest proportion (48.5% and 41.6% respectively). Patients directly referred from physicians had requested for CT of whole abdomen in highest proportion (52.1%) (Figure 1). The male patients requested the highest number for brain CT scans (75.1%) and the female patients mostly requested CT-KUB (38.3%) (Figure 2).

Figure 2: Gender wise requests for CT scans (N=475)



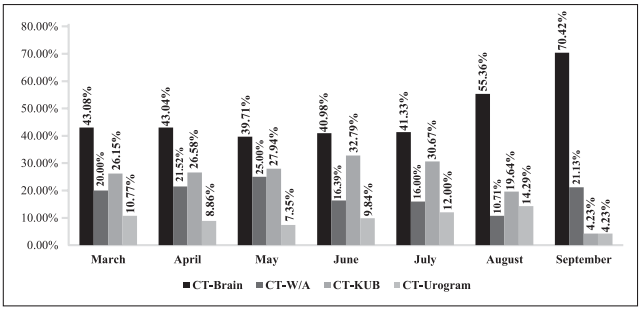
The distribution of the request for CT scans was similar between patients from urban and rural areas. While brain CT scan was the highest in proportion (urban-49.5%, rural-45.7%), CT urogram was the least requested CT scan among them (urban-3.5%, rural- 14.8%) (Figure 3).

Figure 3: Types of CT scan according to the residence status of the patients (N=475)



It was observed that, the monthly proportion of types of CT scan was almost similar in each month with the mean of 67.8±11.2 CT scans per month, the highest number of scans were done in the month of April (16.6%) during this study period (Figure 4). The distribution of the request for CT scans was also similar between patients who were married versus who were unmarried. While brain CT scan was the highest in proportion (married-70%, unmarried- 41%), CT urogram was the least requested CT scan among them (married- 5.6%, unmarried- 10.6%).

Figure 4: Monthly pattern of CT scan requests (N=475)



Discussion

The NIMH is a tertiary level psychiatric specialized hospital, equipped with all available facilities in its inpatient and outpatient departments and has standard diagnostic protocols. The standard maintenance system along with reasonable diagnostic and treatment costs, attracts lots of patients from all over the country to take services from here. CT scan is one of the most utilized diagnostic procedures here, thus reasonably can portray the national and community level utilization of this diagnostic tool which is important to demonstrate the utilization pattern of this procedure. Sociodemographic background is an important determinant of availing healthcare provision, thus requires routine monitoring of the utilization pattern of the diagnostic facilities.

During the study period, a total 475 referrals were made by various institutions including the NIMH itself. Among them brain CT scan was highest in proportion (47.5%) and the scans requested from NIMH were half of the overall requests; 92.8% scan requests from NIMH were for brain CT scans. Thus, in this study the proportion of brain CT scan was the highest. Studies on impact of sociodemographic variability on CT scan in developed country showed that, head and neck CT scans are the most commonly done scans which corresponds with our study findings.[4]

The mean age of the patients was 40.3±16 years and most of the patients (27.5%) were from the age group of 26 to 35 years. In this study, patients who came from rural areas were more (52.4%) than the patients from urban areas (47.5%) and distribution of the requests for CT scans was similar between patients of urban and rural areas. Similar to our findings, a study in Northern England suggests that, young patients from more disadvantaged areas tend to undergo more CT scans.[4] The current study observed that female patients used the diagnostic CT scan 15.3% less often than male patients. While brain CT scans were highest in proportion (75.1%) among male patients, CT-KUB regions were highest (38.3%) among females. Gender inequality in healthcare utilization is observed all over the world and to some extent it explained our study findings.[10,11] Majority of the patients were married during the time of the study (77.4%), however both married and unmarried groups of patients had requested similar types of CT scans. One finding of this study was that, more than half of the patients (60%) were not involved in any sorts of income generation activities which tells that the burden of healthcare expenditure was on the family members. With the mean of 67.8±11.2 CT scans per month, the highest number of scans were done in the month of April (16.63%) during this study.

Conclusions

With the advancement of CT scanning technology, accurate diagnosis and monitoring of prognosis is now serving as an essential and occasionally lifesaving diagnostic tool. New clinical implications of CT scan are being identified, which is also expanding the healthcare expenditure. Extensive studies are required to ensure healthcare facilities for patients from all sociodemographic levels. This study observes some of the contents of sociodemographic profile of patients who underwent CT scan in one of the tertiary level public hospital in Dhaka city and concludes that further detailed data and large-scale study will aid in the evaluation of utilization and referral pattern of the utilization of CT scanning.

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References

1. Khaing M, Saw YM, Than TM, Mon AM, Cho SM, Saw TN, et al. Geographic distribution and utilisation of CT and MRI services at public hospitals in Myanmar. BMC Health Serv Res 2020; 20(1): 742.
2. Wu C-Y, Hu H-Y, Chen L, Huang N, Chou Y-J, Li C-P. Investigating the utilization of radiological services by physician patients: a population-based cohort study in Taiwan. BMC Health Serv Res 2013; 13: 284.
3. Hsueh Y-W, Lin Y-C, Lin C-H, Chen H-C, Huang Z-Y, Chai J-W, et al. Trends in computed tomography scan uses in Taiwan from 2000 to 2013: J Chin Med Assoc 2019; 82(12): 948-56.
4. Pearce MS, Salotti JA, McHugh K, Kim KP, Craft AW, Lubin J, et al. Socio-economic variation in CT scanning in Northern England, 1990-2002. BMC Health Serv Res 2012; 12: 24.
5. Stöppler MC. CT Scan (CAT Scan, Computerized Tomography) Imaging Procedure [Internet]. MedicineNet. [cited 2021 Jan 12]. Available from: https://www.medicinenet.com/cat_scan/article.htm
6. Palesh M, Tishelman C, Fredrikson S, Jamshidi H, Tomson G, Emami A. "We noticed that suddenly the country has become full of MRI". Policy makers' views on diffusion and use of health technologies in Iran. Health Res Policy Syst 2010; 8: 9.
7. Evens RG, Evens RG. Analysis of economics and use of MR imaging units in the United States in 1990. AJR Am J Roentgenol 1991; 157(3): 603-7.
8. Adler NE, Stewart J. Health disparities across the lifespan: meaning, methods, and mechanisms. Ann N Y Acad Sci 2010; 1186: 5-23.
9. Yates PJ, Williams WH, Harris A, Round A, Jenkins R. An epidemiological study of head injuries in a UK population attending an emergency department. J Neurol Neurosurg Psychiatry 2006; 77(5): 699-701.
10. Cameron KA, Song J, Manheim LM, Dunlop DD. Gender Disparities in Health and Healthcare Use Among Older Adults. J Womens Health (Larchmt) 2010; 19(9): 1643-50.
11. Kent JA, Patel V, Varela NA. Gender disparities in health care. Mt Sinai J Med 2012; 79(5): 555-9.