

Pattern of patient referrals to a tertiary neurosurgery center in the central region of Saudi Arabia

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Patients' referrals to neurosurgery centers are faced with multiple challenges in the developing world.¹ Restricted access to care, limited availability of specialized centers, and the absence of an organized referral system are among many others.¹ The delay in consulting the specialist and transferring patients for management may result in additional morbidity and mortality to the patient. Improving the quality of referrals requires a process of careful monitoring of the current system to identify potential areas for improvement. Subsequently, appropriate solutions could be planned and implemented.² This process of quality improvement will help guide resources to their best utilization, allocate them adequately, and avoid repeat incorporation of failing approaches.²

Modern and advanced neurosurgery care in the Kingdom of Saudi Arabia (KSA) is mostly provided through tertiary hospitals in major cities. The process of getting the patient into a tertiary hospital involves several stages: the referral process (time of diagnosis and referral to final acceptance), and the actual transfer of the patient. The primary objective of the present study was to prospectively assess the referral process of neurosurgery cases to King Khalid University Hospital (KKUH) in Riyadh, KSA. Time intervals required for each segment of the referral process were evaluated to identify areas of delay for potential improvement. Secondary goals included determining the pattern of referral diagnoses and map the geographic distribution of the referring hospitals. This may serve as a guide to address various areas according to their needs, and aid in better future communication.

A prospective observational study was conducted after approval from the Institution's Ethics Review Board. It included all patients referred to the Division of Neurosurgery at KKUH from January to June 2009. The center is a major academic and tertiary neurosurgery referral center in the central region of Saudi Arabia and is accessible to all Saudi nationals. Non-Saudis would be eligible as educational or business cases. Inclusion criteria were any neurosurgical referrals from outside the hospital. Exclusion criteria were cases with original referral dates longer than one year, and referrals within the hospital. A research assistant supervised by the study investigators collected data from the referrals in

an excel sheet. Referral details were carefully recorded including age category into adults or pediatrics (under 12 years), patient's gender, referral diagnosis, duration of symptoms, the name, and geographic location of the referring hospital. Time intervals of the 3 main segments of the referral process were recorded. The first was the interhospital time interval (from referring hospital to hospital eligibility office [HEO] at KKUH), second from the time received at HEO to the department of surgery (DOS), and third from the DOS to the neurosurgeon. Referrals are usually faxed to KKUH from outside hospitals then delivered by hand within the hospital departments.

Statistical analyses were performed using the Statistical Package for Social Sciences software (SPSS Inc., Chicago, IL, USA) version 17.0. Summary statistics were provided as mean and standard deviation. The confidence interval (CI) was set at 95%, and the level of significance was determined at $p < 0.05$.

During the study period 195 referrals were received, of which, 122 were males (62.6%) and 6.5% were pediatrics. The response from the 4 neurosurgeons receiving referrals was outpatient appointment in 42.9%, apology for no availability of beds in 21.7%, request for admission in 14.8%, re-direction to another specialty within the hospital in 7.9%, and request for more information in 7.4%. Different means of referral time periods were observed. Interhospital time was 7 days (± 17 , 95% CI: 4-10), time from HEO to DOS was 0.8 days (± 2.6 , 95% CI: 0.4-1.3), and from DOS to the neurosurgeon was 0.35 days (± 0.9 , 95% CI: 0.2-0.5). The mean referral transit time from the referring hospital to the neurosurgeon was 8 days (± 18 , 95% CI: 5-11). Only 37.4% of the referrals managed to be transferred from HEO to the neurosurgeon within one day. Most of the referrals were transcribed on Wednesday (34 reports, 27.9%). The transcription day of the medical report seemed to play a role on the referral transit time, being one day (mode) when the report was transcribed on Saturday to Tuesday (all working days) and 3 days (mode) for reports transcribed on Wednesdays (last working day of the week). Only one referral was performed on Thursday and none on Friday (weekend). The sample size was low for a reliable statistical significance analysis to compare various days. However, it was worth looking at as it may indicate a delay in sending referrals when it approached Wednesday or the weekend.

Analysis of the duration of patients' symptoms revealed that 22 patients (11.3% of the cohort) had a history of presenting illness that was less than one week (mean 3 ± 2.5 days). Most of these patients

were referred because of spine trauma (52.6%) or brain tumors (10.5%). The interhospital time in this subgroup of patients was 4.7 days (± 6.7), time from HEO to DOS was 0.6 days (± 1.8) and from DOS to the neurosurgeon 0.33 days (± 0.6). Considering this group of recent clinical presentation, only 36.4% of referrals were received in the HEO within one day, whereas the transfer to the neurosurgeon within the center was one day in 95% of these cases.

Considering different geographic areas within Saudi Arabia, most referrals were from hospitals in the northern regions of KSA (23.6%), Ministry of Health hospitals in Riyadh area (21.5%), and hospitals in Najran province (15.4%). Spinal degenerative disease and spinal trauma were the most common referral diagnoses (20.2% each) followed by brain tumors (18.5%). Within the most common referring geographic areas, spine pathologies were the most common diagnoses for referrals from Riyadh and Najran provinces, and second commonest in those from the northern regions (Figure 1).

A satisfactory health care system depends on the availability of both good quality health care, and reasonably easy access. This second condition cannot be fulfilled without an adequate and functional referral system. This is very relevant to a large country like Saudi Arabia where most of the advanced and high quality medical care is concentrated in big cities. Hence, the concern about an efficient referral as expressed by several medical specialties.^{3,4} Qureshi et al⁵ investigated the referrals from primary care physicians to psychiatric institutions, and emphasized the importance of a quality referral system for overall national health care planning and quality improvement. Alhamad et al⁴ drew attention to the relation between the advanced stage of nasopharyngeal carcinoma and delayed assessment, and stressed the significance of early referral for improved

outcome of treatment. In our study, we addressed the practice and pattern of neurosurgical referrals in Saudi Arabia. With an average of 8 days for a referral to reach the neurosurgeon, obviously the current referral time is simply too long, especially with 36.5% of referrals requiring admission. Our data show that most of the delay was the 7-day-span between the transcription date of the referral report and its arrival to the tertiary center. However, it was not possible within the limitations of the current study to identify the real cause of this delay. Many factors seem to have played a role. It is interesting to note that most of the referrals in this cohort were transcribed on Wednesdays (27.9%), just before the weekend, where there was delay of referrals by 3 days. Moreover, it is possible that some of the referral reports could have been first sent to another hospital and were later redirected to KCUH.

There are several systematic problems that could be the reason for the delay in the referrals. Poor communication due to lack of administrative and/or technical support in some of the referring hospitals is one factor. This could be solved with enhanced communication provided nowadays by the Internet and e-mails as a potential cost-effective solution. These forms of enhanced communication are expected to transform the culture and the standard of practice of medicine and improve the access to care.⁵ Medical reports, and medical images could be transferred instantaneously by the e-mail system to tertiary hospitals, which, in return, could give an immediate response regarding expert opinion, availability of beds, and the need for patient transfer.

The presence of multiple health care providers within KSA with poor inter-hospital organization could be part of the delay. It is not uncommon for some referrals to circulate in several referral centers before they are finally accepted. Concerted effort and close coordination among the different health care providers are required to overcome these difficulties. A centralized calling platform that allows direct contact between referring hospitals and tertiary centers can offer a solution for urgent cases.

The current study showed that a significant percentage of referrals (42.9%) were given an outpatient appointment reflecting their less urgent nature. Most of these pathologies could have been handled in local hospitals if the treating doctor had direct access to an expert opinion. Additionally, improving the resources of peripheral hospitals may enable them to treat simple neurosurgical conditions locally.

The results of the current study have to be interpreted within its existing limitations. It is a single-center-study

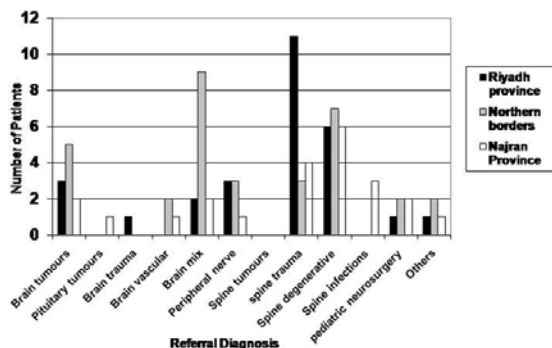


Figure 1 - Neurosurgical center referral diagnoses from the 3 common geographical areas.

and includes a relatively small sample size. However, it disclosed several observations that are noteworthy. It emphasizes the need for an organized national referral system that facilitates timely access of patients to appropriate medical care. Future studies are, however, necessary to identify the exact reasons for the delay in referrals and their impact on patients' morbidity and mortality. These data are essential for better health care delivery and an efficient allocation of health resources.

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