# Impressions and experience of non-neurologists in neurology

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## ABSTRACT

**Objectives:** Neurological disorders are common in Saudi Arabia and the demand for trained neurologists is strong. We aimed to study the impressions and experiences of general physicians in the neurology field and examine their referral practices.

**Methods:** We included attendees of the "neurology for non-neurologists" symposium, which took place from 14-15 October 2004 at King Faisal Specialist Hospital and Research Center in Jeddah, Kingdom of Saudi Arabia. We designed a structured 24-item questionnaire to examine their demographics, training, practice, and referral patterns.

**Results:** One hundred and eight participants registered for the symposium, with 69 (64%) questionnaires returned. Attendee's ages were 23-60 years (mean 35), with 53% being males. There were 46% consultants and specialists, 33.5% trainees, 14.5% students, and 6% other health professionals. Most physicians (62%) practiced in the field of general practice or internal medicine and 62% received a structured neurology rotation during training. Patients with neurological complaints constituted 29.5% of those seen in their practice, and they referred 33.3% to neurology. Only 13.5% and 15.5% were highly confident in diagnosing and treating these patients. Those who reported seeing many patients with neurological complaints (4 on the Likert scale) were 18.8 times more likely to feel highly confident in their diagnoses (95% confidence interval [CI]: 3-195, $p$=0.0002) and 23 times more likely to feel highly confident in their management (95% CI: 3.6-236, $p$=0.0005). Many physicians (20.5%) had no direct access to a neurologist for referrals.

**Conclusions:** Many general physicians were not highly confident in diagnosing and treating neurology patients. Given the limited number of neurologists, we recommend appropriate neurological training of generalists.

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Over the last century, significant developments in the neuroscience field have greatly improved our ability to evaluate and treat patients with neurological disorders, with an associated increase in educational demands for advanced postgraduate neurology training.[1] Neurological disorders are common and comprise a large and increasing proportion of patients seen in general practice.[2] However, in most developing countries including Saudi Arabia, trained neurologists are few and practice mainly in large cities or tertiary care facilities.[3,4] Neurology services are therefore busy with a large volume of referrals and consultations. However, most generalists do not feel confident in managing these patients.[5-8] Casabella et al[5] found that many generalists have an insufficient level of preparation in neurology, and that the level of neurology knowledge needs improvement.[5] Others have found that generalists lacked important clinical information about common neurological disorders

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such as stroke.[6] In a survey of general practitioners in Spain, 79% of those questioned considered their neurology training insufficient for clinical practice, and 56% reported greater difficulties in attending to neurology patients than other internal medicine patients.[7] As well, up to 30% of referrals to neurologists were for minor or simple complaints.[9] We aimed to study the impressions and experiences of general physicians with neurology patients and examine their referral practices. We examined possible contributing factors to unfavorable neurology experiences, such as the teaching experiences and referral access. This information is vital for finding solutions to their difficulties with neurology patients.[3,10] Also, it could help in the prevention and care of neurological problems, and planning of the workforce in neurology.

**Methods.** The study included attendees of the "neurology for non-neurologists" symposium conducted by the Department of Neurosciences, King Faisal Specialist Hospital and Research Center, Jeddah, Saudi Arabia, from 14-15 October 2004. King Faisal Specialist Hospital and Research Center is a large tertiary care facility that provides adult and pediatric care for most of the regional population of western Saudi Arabia. The hospital is linked to King Abdul-Aziz University Hospital and medical school, which is the main teaching center of the western region. The intensive 2-day symposium was directed to the level of general practitioners, residents, fellows, and internists. There were 36 clinical presentations covering different aspects of neurology in the form of updated reviews, seminars, and group discussion. Twenty-one local, national, and international speakers gave these presentations. The authors were members of the organizing and scientific committees. The Saudi Council for Health Specialties accredited the symposium with 11 continuous medical education hours. Before participating in the study, the attendees were assured that taking part in the study was voluntary and that their identity would remain anonymous. A structured 24-item questionnaire was designed to examine their demographic characteristics, training, qualifications, and practice experiences. Attendees were asked about the percentages of patients with neurological disorders that they usually see in their daily practice and the percentages that they would then refer to neurology. The next section of the questionnaire included 3 Likert scale items,[11] to examine the participant's practice and confidence in dealing with neurology patients. Then the participants were asked to select one of the best and worst aspects of neurology based on their experiences. The last section included a question about their access to a neurologist for referrals and an overall evaluation of the symposium. The symposium organizing committee facilitated the distribution of the questionnaires at the registration time. The completed forms were collected when the continuous medical education certificates were distributed at the end of the day. The data were tabulated and analyzed using chi-square statistics for categorical variables.[12] The magnitude of significant associations is presented as *p* values, odds ratios, and the 95% confidence interval for the odds ratios.

**Results.** One hundred and eight participants registered for the symposium. Sixty-nine (64%) questionnaires were returned, however 5 forms were incomplete or duplicate and therefore excluded. The attendee's ages ranged between 23-60 years (mean 35, SD 11), with 53% being males. There were 23% consultants, 23% specialists or senior registrars, 33.5% trainees (interns, residents, fellows), 14.5% medical students, and 6% other health professionals. Excluding medical students, most physicians (62%) were practicing in the field of general practice (26%) or internal medicine (35%). The remaining participants practiced in neurology (15%), neurosurgery (6%), psychiatry (6%), or other specialties (11%). The number of years of post-graduate training ranged between 1-12 years (mean 4.6, SD 3.3). Most physicians (65.5%) were trained within Saudi Arabia, 22.5% received training in North America, 4% in Europe, and 8% in other countries outside Saudi Arabia. Overall, 62% received a structured neurology rotation during their postgraduate training lasting 1-4 months (mean 2). The number of years in practice (medical students excluded) ranged between 1-37 years (mean 8.5, SD 7). The majority (89.5%) practiced within the Jeddah area. Of those in general practice or internal medicine, 61% had future plans for sub-specialization, 45.5% being in the neuroscience field. **Table 1** summarizes the qualification, practice and referral patterns of the attendees. They reported that patients with neurological complaints constitute an average of 29.5% of the patients they see in their practice, and they refer an average of 33.3% of these patients to neurology. The majority (79.5%) had access to a neurologist for referrals within the same hospital, and 12.5% had to refer the patient to another hospital within the same city or to another city in 3%. The remaining 5% reported no access to a neurologist for referrals. **Table 2** shows the results of the Likert scale items examining participant's practice and confidence in dealing with neurology patients. Clearly although the participants frequently see and follow patients with neurological complaints, the level of confidence in making the diagnosis and providing treatments was not high. Only 13.5% and 15.5% were highly confident in diagnosing and treating patients with neurological disorders. Those who reported seeing many patients with neurological complaints (4 on the Likert scale)

**Table 1 -** Qualification, practice and referral patters of attendees (n=69).

| Variable | Number/Total* (%) | |
|---|---|---|
| ***Qualification*** | | |
| Medical Degree only | 37/69 | (53.5) |
| Arab/Saudi Board | 14/69 | (20) |
| FRCPC/FRCSC | 4/69 | (6) |
| MRCP | 2/69 | (3) |
| Other | 2/69 | (3) |
| None | 10/69 | (14.5) |
| ***Practice*** | | |
| University Hospital | 13//69 | (19) |
| Ministry of Health | 16/69 | (23) |
| Military/National Guard Hospital | 16/69 | (23) |
| Private Hospital | 14/69 | (20.5) |
| Other | 10/69 | (14.5) |
| ***Percentage of patients you see with neurological complaints?*** | | |
| Less than 10% | 5/67 | (7.5) |
| 10-20% | 15/67 | (22.5) |
| 21-40% | 25/67 | (37) |
| 41-60% | 9/67 | (13.5) |
| More than 60% | 13/67 | (19.5) |
| ***Percentage of patients with neurological complaints that you refer to a Neurologist?*** | | |
| Less than 10% | 10/61 | (16.5) |
| 10-20% | 8/61 | (13) |
| 21-40% | 22/61 | (36) |
| 41-60% | 11/61 | (18) |
| More than 60% | 10/61 | (16.5) |

*Total - total number of those who responded to the question
FRCPC - Fellow of the Royal College of Physicians Canada
FRCSC - Fellow of the Royal College of Surgeons Canada
MRCP - Member of the Royal College of Physicians (United Kingdom)

**Table 2 -** Results of the Likert Scale items examining physician's practice and confidence in dealing with Neurology patients.

| Question items | % | Mean score* |
|---|---|---|
| ***Do you frequently see and follow children with neurological disorders?*** | | 2.9/4 |
| Not at all | 0 | |
| Somewhat | 28 | |
| Moderately so | 34 | |
| Very much so | 28 | |
| ***Do you feel comfortable diagnosing patients with neurological disorders?*** | | 2.7/4 |
| Not at all | 3 | |
| Somewhat | 40 | |
| Moderately so | 43.5 | |
| Very much so | 13.5 | |
| ***Do you feel comfortable treating patients with neurological disorders?*** | | 2.6/4 |
| Not at all | 4.5 | |
| Somewhat | 46 | |
| Moderately so | 34 | |
| Very much so | 15.5 | |

*Minimum score = 1
Maximum score = 4

**Table 3 -** Participant's responses regarding the best and worst aspects of neurology and correlations with position and gender.

| Question items regarding neurology | Total response (%) | Attendee (%) | | Gender (%) | |
|---|---|---|---|---|---|
| | | Consultant | Other | Female | Male |
| ***Best aspects*** | | | | | |
| Challenging and interesting field | 50 | 56 | 44 | 45 | 55 |
| Helping children | 38 | 42 | 58 | 56 | 44 |
| Good prognosis and recovery | 7.5 | 28 | 72 | 29 | 71 |
| Job opportunities | 3 | - | 100 | - | 100 |
| Other | 1.5 | - | 100 | 100 | - |
| ***Worst aspects*** | | | | | |
| Poor prognosis and treatment | 46 | 43 | 57 | 61 | 39 |
| Difficult and complicated | 31 | 70 | 30 | 40 | 60 |
| Emotionally stressful | 8 | 60 | 40 | 60 | 40 |
| Long training | 1.5 | - | 100 | - | 100 |
| Other | 13.5 | 22 | 78 | 25 | 75 |

were 18.8 times more likely to feel highly confident in their diagnostic skills (95% CI 3-195, $p$=0.0002), and 23 times more likely to feel highly confident in their management (95% CI 3.6-236, $p$=0.0005) when compared to those who saw less patients (1-3 on the Likert scale). Participants who received a structured neurology rotation during training felt slightly more confident in managing their patients compared to those who never received a structured rotation (18% versus 12.5%, $p$=NS). Participants interested in pursuing a career in specialties other than neurology were less confident in diagnosing neurological patients when compared to those who were interested in neurology sub-specialization ($p$=0.03). **Table 3** shows the responses of attendees regarding the best and worst aspects of neurology and the correlations with their position and gender. The responses were quite similar, and the differences did not reach statistical significance because of the small numbers. Regarding the overall evaluation of the symposium, 51% felt that it was excellent, 37% very good, 10.5% good, 1.5% fair, and none gave it a poor rating.

**Discussion.** The results suggest that many non-neurologists do not feel comfortable in handling neurology patients. Several other studies documented the difficulties encountered by generalists when faced with neurology patients.[5-8] Generally, practitioners working in primary care were found to have less confidence in handling patients with neurological disorders than patients with other common medical conditions.[8] This is most likely related to inadequate training experiences. Proper neurology practice depends heavily on the level of medical education and training.[13,14] In the USA, for example, many neurologists are concerned that patients with neurological disorders are not receiving the service they need, and support the need for additional neurology training for general residents.[15,16] Others found that residency training overemphasizes acute inpatient care of less common neurological disorders compared with outpatient care of more common disorders commonly encountered in daily practice.[17] There is evidence that training in neurology requires changes in the system of medical education, particularly emphasizing the development of adequate personal attributes, skills, and habits to seek out information independently rather than simply the transmission of factual information.[18]

Although the generalists in this study reported that approximately one third of patients seen in their practice had neurological complaints, they referred only 33% of them to neurology. This may be related to referral limitations, as 20.5% had no direct access to a neurologist. The other possible explanation is their relatively long clinical experience post-graduation (mean 8.5 years). Those who reported seeing many patients with neurological complaints were more likely to feel highly confident in their diagnostic and management skills, highlighting the importance of clinical experience. Another possibility is that these physicians have a special interest in these disorders. Interestingly, physicians who were interested in pursuing careers in specialties other than neurology were less confident in diagnosing neurological patients reflecting the effect of their lowered interest in neurology. The assessment and management of neurological disorders require specific knowledge, skills, and attitudes, which can be supported by medical education.[19] Several studies documented a decline in general neurology education and found that the education was deficient in training physicians to manage general neurological disorders.[20,21]

Regarding participant's responses on the best and worst aspects of neurology, we were able to identify some factors that can be influenced to promote careers in the field amongst generalists. Although many of them felt that neurology is a challenging and interesting field that provides help to patients, they also felt that many disorders carry poor prognosis with limited treatments and are difficult and complicated. Few reported that neurology is emotionally charged and requires very long postgraduate training. In our recent study evaluating the attitudes of medical students toward neurology, we found that although 92% found neurological disorders challenging and interesting, the majority (>77%) had unfavorable attitudes.[20] Most students felt that their teaching experiences were not strong, and only 6% actually selected neurology as the first future career choice. However, the actual clinical experience may positively influence many of these misconceptions and apprehension.[22] Also, many students may change their early medical career choices, as only 65% of medical students were found working within their first career choice in a long term follow up study.[23] This would encourage us to continue to stimulate and interact with residents and generalists to increase their interest in neurology and promote the specialty. This is particularly important given the limited number of neurologists in our country. The shortage of neurologists in Saudi Arabia and other developing countries needs to be evaluated and studied systematically.

There are some limitations to our study. The sample was relatively small and may not be representative of generalists in the community. Participants selected to attend this neurology symposium, which may reflect their difficulties or interest in the field. In fact, 45.5% of those who had future plans for sub-specializations selected a neuroscience specialty reflecting their interest in the field. This fact may limit the ability to generalize from our findings. However, our sample was

heterogeneous with a good response rate, wide age variation, even sex distribution, and representation from several institutions and physician categories. The symposium received a positive evaluation; however, some of the opinions might have been favorably biased by participants practicing in the neuroscience field or presenting faculty members.

To conclude, many generalists were not highly confident in diagnosing and treating their neurology patients. We recommend appropriate neurological training of generalists, given the limited number of neurologists. They can accomplish this during their residency and by attending interactive continuous medical educational activities such as our symposium.

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