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Short Communication

Pattern of Neurological Manifestations in Patients Referred to the Neurology Clinic of a Reference Military Hospital

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Abstract

Background: The field of neurology encompasses a wide range of disease types, and recognizing the most common manifestations of these diseases, particularly in subgroups, is critical for improving appropriate diagnostic and therapeutic measures.

Objectives: The purpose of this study was to determine the frequency of common manifestations of neurological diseases in patients referred to a military hospital's internal neurology clinic.

Methods: This was a cross-sectional descriptive study of patients referred to the internal neurology clinic of a reference military hospital, Tehran, Iran in 2020. The sampling was done at random using a checklist. Finally data was analyzed by using SPSS software.

Results: Women made up the majority of patients in 336 samples 182 (54.2 %) versus 154 (45.8 %). The patients' average age was 49.5 ± 16.5 years, with 28.3 % (n = 95) being elderly. The three most common complaints raised by patients were headache, movement disorder, and sensory disorder, accounting for 29.5%, 27.7%, and 27.7% of complaints, respectively. Seventeen patients (5.1%) also mentioned other issues, with anger, anxiety, depression, and nausea being the most common complaints.

Conclusion: Headache, movement disorder, and sensory disorder are the most common neurological disorders referred to a military hospital. Because of the high prevalence of these issues, it is necessary to establish specialized clinics and conduct additional research to determine the most common types of sensory and movement disorders, as well as the most effective methods of prevention and treatment in medical centers.

Keywords: Neurologic Manifestations, Nervous System Diseases, Hospitals, Military Medicine

1. Background

Neurological disorders are common and expensive. According to WHO estimates, neurological disorders affect more than one billion people worldwide. This includes 12% of global disease burden and 14 percent of global mortality. As the world's population ages, this figure is expected to rise.[1] At the 2017 World Brain Assembly in New Zealand, Dr. Barroso, Editor-in-Chief of the *Lancet Neurology*, described brain health as the greatest challenge for communities in the twenty-first century.[2]

Neurology is concerned with a wide variety of diseases. Neurological problems, which frequently necessitate specialized counseling, account for approximately 15%-20% of all medical admissions and 40% of patients in medical wards.[3] Given the wide range of manifestations of neurological diseases and diseases in this area, it appears necessary to recognize the most common manifestations and diseases, train medical staff to deal with these cases as correctly as possible, and provide appropriate diagnostic and therapeutic equipment.[4-6]

Extensive research has been done in the field of neurological diseases. Lempert and Neuhauser conducted a retrospective study in 2009 to investigate the prevalence and clinical spectrum of psychogenic disorders in neurology. The study found that 9% of patients with obvious neurological manifestations have psychogenic disorders as the primary cause of their disease, with pain being the most common psychogenic symptom, followed by locomotor system symptoms, confusion, psychogenic epilepsy, motor symptoms, and visual disturbances.[7]

Awan et al surveyed the extent of neurological disorders in urban and rural clinics in Sindh province, Pakistan, in another study published in 2019.[8] The average age of the participants was 40.6 years, with a standard deviation of 15 years, according to the findings. The majority of patients (56.6%) were female, and nearly three-quarters (72.6%)

came from rural hospitals. Headache disorders (33.4%), nerve and root lesions (27.1%), vascular diseases (13.3%), epilepsy (5.2%), muscular disorders (3.9%), psychiatric disorders (3.1%), and central nervous system infections were all identified as common neurological diseases in this study (2.8%).[8]

In Iran, numerous studies on neurological diseases have been conducted. After reviewing 13 articles published between 1990 and 2008, a systematic review study focusing on the frequency of stroke, its risk factors, types of stroke, and its mortality in Iran,[9] concludes that the information stroke epidemiology, pattern, and risk factors are uncommon in Iran, but available data show a relatively low prevalence of stroke. The results were higher than in Sub-Saharan Africa, but lower than in developed countries like India, the Caribbean, Latin America, and China. The findings may reflect Iran's similarities with neighboring countries as well as its conflict with the West.[9]

Another 2019 study on the incidence of neurological diseases in Iran in different age groups between 1990 and 2017 found that headache, epilepsy, and Alzheimer's were the most common neurological diseases in terms of incidence and had the highest incidence in Iran.[10]

As far as we know, no comprehensive study has been conducted in Iran to investigate the frequency of clinical manifestations of neurological diseases. As a result, there are no accurate statistics on the main complaints of patients referred to neurology clinics in Iran at the moment, and, as previously stated, only sporadic studies on the prevalence, incidence, causes, and factors affecting some manifestations or diseases in the field of internal neurology medicine have been conducted.[11-14]

2. Objectives

The purpose of the present study was to determine the frequency of typical representations of neurological diseases in patients referred to the internal neurology clinic of a military hospital.

3. Methods

3.1. Study Design

The current study is a descriptive cross-sectional study that was conducted at Baqiyatallah hospital, Tehran, Iran. The study population includes all patients referred to the hospital's internal neurology clinic in the first half of 2020. All the patients who were referred to complete the medical commission form and the cases who patients companion (without the patient's presence) had referred only to renew the prescription, according to the pre-determined contract, were excluded from the study before sampling.

3.2. Sample Size and Sampling Methods

In the current study, a randomized sampling strategy is used to determine the statistical population using Cochran's formula.[15] The number of patients referred to the clinic was required for this purpose. During the six-month research period, this number was estimated at 15 000 patients by estimating the number of monthly patients of the hospital's internal neurology clinic. As a result, the statistical population size was 336 when using Cochran's formula with alpha error of 0.05 and beta error of 0.2. As a result, 336 patients were chosen at random from the hospital's internal neurology clinic to participate in the study. The randomization was done through using a random numbers table choosing 336 patients from all eligible patients for inclusion.

3.3. Data Collection

A checklist was created with various items such as age, gender, main complaint at the time of referral, time of the main complaint, history of drug use and hospitalization in the main complaint, and so on. The data were completed and collected using the designed checklist, by asking the patient referred to the hospital's neurology clinic or his/her companions to observe the following:

1. Prior to completing the checklists, patients were given important information about the research plan and the confidentiality of their personal information. A pre-designed written consent form was signed by the patient or companion.
2. To avoid the executor's bias in selecting patients and to eliminate potential errors, patients were first asked to cooperate in completing the checklist by entering the doctor's room. However, because this method sometimes causes overcrowding in the doctor's room, causing patients to lose their turns or the loss of some patients to request cooperation, patients were sometimes asked to cooperate in completing the checklist outside the physician's room in order of patient print order. Patients in the waiting room who had an appointment with a neurologist were sometimes asked to help complete a checklist.
3. Initially, patients were asked to cooperate in completing the checklist for entering the physician's room in order to avoid the error of bias in patient selection and to eliminate potential errors. This method can cause crowding in the doctor's office or cause patients to miss their turns. On the other hand, it can result in the loss of some patients who had previously requested cooperation. As a result, patients were occasionally asked to assist in completing the checklist in the order of patient print order outside the physician's room. Patients in the waiting room who had an appointment with a neurologist were occasionally asked to complete the checklist.
4. Physicians in the clinic had more scheduled hours in the morning than in the evenings and at night, and the number of patients followed the same pattern. Following a week of observing the approximate number of patients in the morning, evening, and night clinics, the approximate number of patients in the morning clinics per hour was estimated to be twice that of the evening and night clinics. As a result, this ratio was used in sampling. Each hour of morning

clinics is thus sampled twice as much as each hour of evening clinics. However, due to the inconsistency of the physicians' schedules throughout the sampling period, the above ratio could not be observed 100% of the time.

3.4. Data Analysis

Based on the WHO definition, adolescence covers the age range of 10 to 19 years, and adults are over 19 years old.[16] The individuals aged 60 and older are in the elderly group.[17] According to the Oxford Dictionary,[18] the onset of middle age is estimated at 45 years. Aging groups were determined based on this classification.

The IBM SPSS Statistics software version 19 was used to analyze the data. For quantitative variables, the results are expressed as mean and standard deviation (mean SD), and for qualitative variables, as frequency and frequency percentage. Furthermore, a chi-square test was used to examine the relationship between physician gender and patient gender, and the significance level in the current test was 0.05.

4. Results

There were 182 (54.2%) women and 154 (45.8%) men among the 336 sample sizes. Patients referred to the neurology clinic ranged in age from 11 to 86. The patients' mean age was 49 years and 6 months, with a standard deviation of 16 years and 6 months. 196 patients (5.3%) were referred to the attending physician to begin diagnosis and treatment, and 140 patients (41.7%) were referred to the attending physician to continue diagnosis and treatment. There was no statistically significant relationship between physician gender and patient gender ($P = 0.333$).

The mean age of the patients was 49.5 ± 16.5 years, of which 36% (n = 12) were adolescents, 32.1% (n = 108) were youth, 36% (n = 121) were middle-aged, and 28.3% (n = 95) were elderly.

Out of a total sample size of 336, 228 (67.9%) were residents of Tehran province, 37 (11%), Alborz province, 69 (20.5%) were residents of other provinces, and 2 were residents of Afghanistan. Out of 228 Tehran province residents, 190 (83.3%) were from Tehran city and 36 (15.8%) were from other Tehran province cities. Two (0.9%) of patients in Tehran province did not provide more specific address information.

Among 336 patients, 272 (81.0%) were married, 44 (13.1%) were single, 17 (5.1%) were widowed, and 3 (0.9%) were divorced. 151 (44.0%) were housewives, while 84 (25%) were retired. These two groups accounted for 231 (69.9%) of all patients. Military personnel and soldiers made up 25 (7.4%) and 6 (1.8%) of the total patients, respectively.

Table 1 summarizes the patients' medical histories. According to this table, 36.3% and 33.0 percent of the patients, respectively, had at least one case of heart disease or one case of endocrine disease in the past or during sampling. Furthermore, 11.3% of the patients had had a stroke, and 7.4% had a history of psychological disorders.

Table 1. Medical history of patients referred to the internal neurology clinic of a reference military hospital in Tehran in 2020

Medical Record	Frequency	Percent
Multiple sclerosis	12	3.6
Parkinson disease	11	3.3
epilepsy (in the past or while studying)	21	6.3
Stroke (in the past or while studying)	38	11.3
At least one cardiovascular disease (past or present)	122	36.3
At least one endocrine disease (past or present)	111	33.0
At least one psychiatric disorder (past or present)	25	7.4

As shown in Table 2, the most common primary complaints are headaches, movement disorders, and sensory disorders. In addition, 17 of 336 patients (5.1%) stated that being affected by other diseases is their primary concern. These 17 patients reported feelings of anger (n = 4), anxiety (n = 2), personality change (n = 1), depression (n = 2), nausea (n = 3), lower urinary tract symptoms (feeling of incomplete bladder emptying) (n = 1), epistaxis (n = 1), mispronouncing words (n = 1), feeling tired and lethargic (n = 1), and hiccups (n = 1). Thirty-five patients (10.4%) reported limb and/or spine pain as their primary complaint. Of these, 16 patients (4.8%) reported pain in the spine, 14 patients (4.2%) reported pain in the limbs, and 5 patients (15%) reported pain in both the limbs and the spine as their initial complaint.

In addition to the main complaint, 57 patients out of the 336 sample size filed a secondary complaint. Headache, movement disorder, and sensory disorder accounted for 22.8%, 19.3%, and 19.3% of the secondary complaints, respectively, and accounted for a total of 61.4% of the secondary complaints. It should be noted that they follow the same pattern as the initial complaints. Six patients were in the "Other Complaints" category, with complaints of anger (n = 2), depression (n = 1), and lower urinary tract symptoms (n = 2).

Seven (12.3%) of the 57 patients who submitted secondary complaints reported limb and spine pain as their secondary complaints. One patient (1.8%) reported pain in both the limbs and the spine, two patients (3.5%) reported only limb pain, and four patients (7%) reported pain in the spine as a secondary complaint.

Table 3 shows the frequency and percentage of neurological representations in the total of patients' primary and secondary complaints. According to this table, headaches, movement disorders, and sensory disorders were identified as the primary or secondary complaints by 33.1%, 30.7%, and 31.0% of the patients, respectively. Furthermore, 8.3% of patients reported that the initial complaint occurred shortly after a stroke.

5. Discussion

Measuring the prevalence of a disease or other health outcome in a population and determining how the prevalence of the disease varies over time or between

Table 2. Frequency of Chief Complaint in Patients of the Internal Neurology Clinic of a Reference Military Hospital in Tehran in 2020

Complaint	Frequency	Percent	Chief Complaint	Frequency	Percent
Headache	99	29.5	Sleep disorder	8	2.4
Movement disorder	93	27.7	Speech problem	7	2.1
Sensory disorder	93	27.7	Partially deaf	4	1.2
Balance disorder	35	10.4	Swallowing disorder	2	0.6
Visual impairment	21	6.3	Head trauma	2	0.6
Convulsions	19	5.7	Odor disorder	1	0.3
Memory impairment	13	3.9	Taste disorder	1	0.3
Consciousness disorder	10	3	Other	17	5.1

Table 3. Frequency of Neurological Manifestations in Primary and Secondary Complaints of Patients Referred to the Internal Neurology Clinic of a Reference Military Hospital in Tehran in 2020

Primary or Secondary Complaint	Frequency	Percent
Headache	110	33.1
Movement disorder	102	30.7
Sensory disorder	103	31.7
Feeling of pain in the limbs and / or spine	42	12.7
The initial complaint was followed by a stroke	28	8.3

subgroups is regarded as an essential step in determining the possible causes of a disease and effective methods of prevention and care. Neurological diseases are common and expensive, and their prevalence is increasing as people age. The prevalence of such diseases varies between developed and developing countries, as well as between population subgroups.[19] In Iran, numerous studies on neurological diseases have been conducted. A significant number of these studies have been linked to headaches and migraine headaches.[20,21] However, no comprehensive study has been conducted to survey the frequency of clinical manifestations of neurological diseases in Iran, so accurate statistics on their prevalence are not available. The current study sought to determine the frequency of neurological disease representations in patients referred to the clinic of the military reference hospital.

In this study, the majority of patients were women (n = 182, 54.2%) compared to men (n = 154, 45.8%), which is consistent with the findings of Awan et al[8] who found that the majority of patients were women (56.6%).

According to the current study findings, 57% of female patients (n = 90) were referred to female physicians, while 48 percent of male patients (n = 86) were referred to male physicians. As a result, there was no significant relationship between patient gender and physician gender. This contrasts with where nearly 80% of male patients were referred to male physicians while only 30% of female patients were referred to female physicians.[22]

The mean age of participants in Awan et al. study was 40.6 years, with a standard deviation of 15 years, indicating that our patients were nearly ten years older on average.[8]

Headache was the primary or secondary complaint of 112 patients in this study (33.3%). As a result, the current study is consistent with the work of Awan et al, who found that the most common neurological disease was headache disorders (33.4%).[8]

According to Rasmussen et al[23] the spot prevalence of headache was 11% in men and 22% in women in a 1991 study. Stovner et al[24] discovered that 53% of the 205 000 adult participants experienced a headache in less than a year in another systematic review published in the *Journal Headache and Pain* in 2010. It is worth noting that these differences are most likely due to differences in research methods, as well as differences in the race and climate of the population under study.

The spot prevalence of Parkinson's disease in the general population aged 40 years and older was reported to be about 0.3 percent in the study by Pringsheim et al[25] which is similar to the study results by Tan et al.[26] However, only 3.3% of patients had Parkinson's disease. This disparity is most likely due to differences in the methods used to conduct the study and determine the statistical population.

Patients over the age of 45 were studied in Kamal et al[27] 19% of them had a previous stroke experience, which is about 8% higher than the results of our study. Again, differences in results may be due to differences in research methods as well as differences in climate and lifestyle, which necessitate further investigation to determine the cause of these differences.

5.1. Study Limitations

It is only a single-center survey, with a cross-sectional design and no long-term follow-up for the patients. However, we attempted to conduct the study with an acceptable sample size in a neurology referral center to make the findings more generalizable.

6. Conclusion

Headache, movement disorder, and sensory disturbance are among the most critical neurological disorders referred to a military reference hospital. The establishment of specialized clinics and further studies to determine the predominant types of sensory and motor disorders and the most effective methods of prevention and treatment in medical centers, given the high prevalence of headaches, is considered a necessity.

Authors' Contributions

FA, FA, MSI, SJHA, and EDM. all contributed in conceptualization,

Research Highlights

What Is Already Known?

- A wide variety of neurological clinical manifestations is reported in the literature.
- Clinical manifestations of neurological disorders may vary based on regional factors.

What Does This Study Add?

- This study reports the most common clinical manifestations of a neurologic referral clinic in Tehran.
- Headache, movement disorder, and sensory disorder are the most common neurological disorders referred to a military hospital.

data analysis, drafting the manuscript. All authors confirmed the final version of the paper.

Conflict of Interest Disclosures

All of the authors declare that they have no conflicts of interest in the present study.

Ethical Approval

Crucial explanations were given to patients before sampling, and written consent was obtained from them. In addition, the obtained information from each patient, except in the scope of the present research, is not used in any other cases and remains confidential. This study's protocol is approved by the national ethics committee with approval ID of IR.BMSU.BAQ.REC.1398.041.

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