

# Newly diagnosed seizures in adults

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## ABSTRACT

**Objective:** To study the clinical, electroencephalographic (EEG) and computed tomography (CT) profile in a hospital population of over 18-years adult patients with newly diagnosed recurrent seizures.

**Methods:** The clinical profiles obtained from history including detailed description of the seizures, examination, EEG and CT findings were recorded prospectively for all over-18 patients who were referred to the electrodiagnostic service at King Fahd Hospital of the University, Al-Khobar, Eastern Province, Kingdom of Saudi Arabia from January 1, 1996 to December 31, 1997. The data was entered into a standard database file and analyzed using a personal computer.

**Results:** Seventy-three patients (43 males, 30 females, mean age 32.3 years) with newly diagnosed recurrent seizures were studied. A positive family history of seizures was found in 12.3%. The main seizure types were partial in 27 (37%), partial with secondary generalization in 22 (30.1%) and

generalized in 24 (32.9%). The types of epileptic syndromes included localization-related 34 (46.6%), generalized 24 (32.9%) and undetermined 15 (20.5%). The EEG was abnormal in 45 (61.6%) with epileptiform activity, focal in 22 (48.9%), generalized in 11 (24.4%) and non-epileptiform activity in 12 (26.7%). The cranial CT findings were normal in 44 patients (60.3%) and abnormal in 29 (39.7%) patients, with focal lesions in 19 (65.5%) and generalized cerebral atrophy in 10 (34.5%).

**Conclusion:** Our results showed that partial and partial with secondary generalization seizures are the most frequent seizure type and the most common epileptic syndrome was the localization-related type in this age group. These results are comparable to previous population- and hospital-based western reports.

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Seizures are events resulting from abnormal excessive and self-terminating neuronal discharges leading to an altered state of brain function, whereas epilepsy is recurrence of these seizures.<sup>1,2</sup> The International League Against Epilepsy (ILAE) made significant efforts for establishing and revising an accepted classification for the types of epileptic seizures and syndromes.<sup>3-5</sup> The annual incidence of epileptic seizures ranges from 20 to 70 per 100,000<sup>6</sup> and the point prevalence 0.4-0.8%.<sup>7</sup> The appropriate management of epileptic seizures, outcome and prognosis are dependent on determining the type of seizure, epileptic syndrome and the underlying cause which relies primarily on the neurological history, examination, neuro-imaging and the electroencephalogram (EEG).<sup>2,8</sup> Recent studies

considered clinico-electrical, imaging and pathological patterns of certain epileptic syndromes in children.<sup>9</sup> A similar prospective study from our department in children up to the age of 13 years has recently been published.<sup>10</sup> The aim of the present study is to examine the clinical, EEG and computed tomography (CT) profile in a hospital population of over 18-years adult patients with newly diagnosed recurrent seizures who were referred to the Neurodiagnostic Laboratories of King Fahd Hospital of the University (KFHU), Al-Khobar, Kingdom of Saudi Arabia (KSA) between January 1996 and December 1997.

**Methods.** A total of 73 consecutive patients (43 males and 30 females) with newly diagnosed recurrent

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seizures were seen in the Neurodiagnostic Laboratories of the Neurology Department at KFHU, Al-Khobar, KSA between January 1996 and December 1997. The KFHU is a referral tertiary care hospital for the entire Eastern Province with an estimated population of 3 million. A pre-coded data form was completed to collect the relevant history, neurological examination and CT findings for every patient. Standard EEG records were obtained using a 21-channel Electroencephalograph (Model EEG-4421, Nihon Khoden Corporation, Tokyo, Japan). All the EEG records were read by the same electroencephalographer to minimize inter-observer variability. The data was entered into a standard data base file using a personal computer and analyzed using the statistical package for social sciences.

**Results.** Out of 73 patients, 43 were males (mean age 32.3 years, range 19-80 years) and 30 were females (mean age 34.6 years, range 19-69 years). The main clinical diagnoses were simple partial and complex partial seizures 27 (37%), partial with secondary generalization 22 (30.1%) and generalized seizure in 24 (32.9%). The frequency of the type of newly diagnosed seizures in relation to the age of onset is given in **Figure 1**. The main epileptic syndromes included localization related 34 (46.6%), generalized 24 (32.9%) and undetermined 15 (20.5%). It was noted that 60 (82.2%) of the patients presented within a year from the onset of seizures. A positive family history of seizures was present in 9 (12.3%). The EEG was abnormal in 45 (61.6%) patients. The abnormalities in this group included partial epileptiform activity in 22 (48.9%), generalized epileptiform activity in 11 (24.4%) and non-epileptiform in 12 (26.7%) patients. Cranial CT findings were normal in 44 patients (60.3%) and abnormal in 29 (39.7%) with focal lesions in 19 patients (65.5%) and generalized atrophy in 10 (34.5%). The abnormal CT findings are shown in **Table 1**.

**Discussion.** Characterization of an epileptic seizure is a prerequisite for making the correct diagnosis of the seizure type, etiology, epileptic syndrome, selecting the appropriate anti-epileptic drug and predicting prognosis and outcome in the patient.<sup>2,8,11,12</sup> Our results showed a relative male preponderance. The steady decline in the frequency of newly-diagnosed seizures with age is similar to previous reports.<sup>13,14</sup> Our results also reflect a more common delay in diagnosis where 82.2% of patients presented within a year compared to 50% reported by Gummit.<sup>15</sup> This probably reflects the general lack of public awareness about seizures and epilepsy. The proportion of patients with partial and partial with secondary generalization (67%) and generalized (32%) are similar to the results of the British National General Practice population-based study in newly-diagnosed epileptic seizures of 52% and 39% respectively.<sup>16,17</sup> However, the distribution of epileptic syndromes in our patients was localization-related (46.6%), generalized

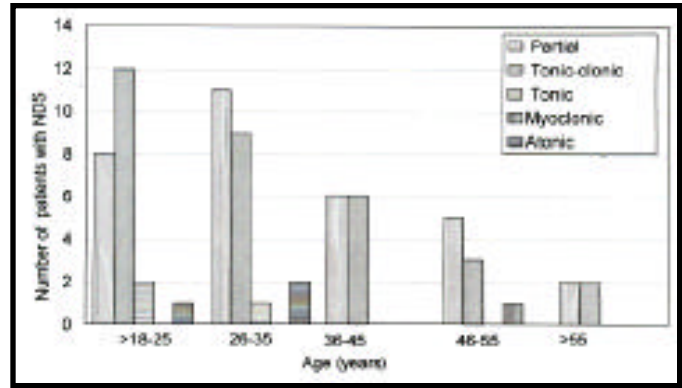


Figure 1 - Bar graph showing the age distribution of types of newly-diagnosed seizures (NDS) (N=73).

Table 1 - Computed tomography findings in 73 over-18 patients with newly diagnosed seizures.

Finding	n	%
Cerebral atrophy	10	(13.7)
Ischemic infarct	8	(11.0)
Tumor	4	(5.5)
Intracranial calcification	2	(2.7)
Subdural hematoma	2	(2.7)
Central nervous system infection	1	(1.4)
Arteriovenous malformation	2	(2.7)
Normal	44	(60.3)
<b>TOTAL</b>	<b>73</b>	<b>(100)</b>

(32.9%) and undetermined (20.5%) compared to (38.7%), (8.3%) and (53%) obtained for 300 patients with new-onset seizures.<sup>11</sup> In the latter study combination of clinical, EEG and cranial magnetic resonance imaging to reclassify their patients resulted in an overall classification of localization-related (58%), generalized (23%) and undetermined (19%) which is closer to our results. The EEG was abnormal in 62% of our patients compared to 68% in the latter study.<sup>11</sup>

The recorded epileptiform abnormalities were focal in 48.9%, generalized in 24.4% and non-epileptiform in 26.7% compared to 30.4%, 50.6% and 19% in a similar study carried out in 263 children ≤ 13 years of age,<sup>10</sup> which shows the clear predominance of partial epileptic seizures in the present adult age group. The EEG showed considerable variations and overlap among the different seizure types as previously reported.<sup>10,17</sup> This finding probably calls for setting more specific criteria for EEG classification of epileptic seizure types. The

wide variability has made some workers propose the use of anatomico-pathological defining criteria for classification of seizure types more than clinico-electrical definitions alone.<sup>18</sup>

The cranial CT abnormalities were present in 39.7% compared to 39.5% in our childhood study.<sup>10</sup> However, whereas cerebral atrophy was the main CT finding (25%) in the childhood study,<sup>10</sup> focal abnormalities were predominant (65.5%) in the present study. The cranial MRI is now considered the neuroimaging tool of choice<sup>19</sup> but the yield of abnormalities in a recent study was comparatively low 14.4%.<sup>11</sup> Our results showed that partial and partial with secondary generalization seizures are the most frequent seizure type and the most common epileptic syndrome was the localization-related type in this age group. These results are comparable to previous population- and hospital-based western reports.<sup>11,17,20</sup> However, there was an observable difficulty in matching epileptic patient groups from different studies applying the ILAE classifications for typing epileptic seizures and syndromes. It is probably the application of all defining parameters namely clinical, electrical, anatomical and pathological criteria are indeed needed to achieve better definition of various types of epileptic seizures and syndromes.

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