

Epidemiology of Late onset Epilepsy in Algeria

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Abstract:

Background: Epilepsies are the most common chronic disabling neurological conditions. Late-onset epilepsies are always suspicious and often pose the problem of their etiology. It is an epileptic disease whose first epileptic seizure begins from the age of 25 years. The aim of this study was to study the epidemiological characteristics of epilepsies in subjects whose first epileptic seizure begins from the age of 25 years.

Materials and Methods: The study population includes all Algerian patients whose age of onset of the first seizure is 25 years or more, recruited during the period from January 2008 to December 2016 at ALI AIT IDIR Hospital in Algiers. Patient recruitment benefited from two cohorts: one in a retrospective study over 6 years (from January 1, 2008 to December 31, 2013), the other in a prospective study over 3 years (from January 1, 2014 to December 31, 2016).

Results: Among 336 patients with late onset epilepsy seen between 2008 and 2016. 175 are men (52.1%) and 161 are women (47.9%). Therefore, a sex ratio of 1.08 in favor of the male sex. There is a variation in the incidence of epilepsy with increasing age. The age pyramid shows the evolution of the incidence with advancing age. It involves taking into account the structure of the population. 63% of the patients in our study come from the wilaya of Algiers, 16.7% from the western wilayas, 16.4% from the eastern wilayas and 3.9% from the southern wilayas.

Conclusion: The average age of our patients was 47.6 years with limits ranging from 25 to 85 years and the sex ratio was 1.08 in favor of the male sex. Among our 336 patients, 175 are men (52.1%) and 161 are women (47.9%). There are a variation in the incidence of late onset epilepsy with increasing age. During the study period, 336 cases of late-onset epilepsy were diagnosed; it is a proportion of late onset epilepsy of 34% compared to all epilepsies. The majority of our patients were from the Wilaya of Algiers (63% of cases). 16.7% from the western wilayas, 16.4% from the eastern wilayas, and 3.9% from the south of the country.

Key Words: Late onset epilepsy, Average age, Sex ratio, Incidence of late epilepsy, Age pyramid, Geographical origin, Wilayas of Algeria, Wilaya of Algiers, Western wilayas, Eastern wilayas, Southern wilayas.

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I. Introduction

Epilepsies are the most common chronic disabling neurological conditions. Late-onset epilepsies are always suspicious and often pose the problem of their etiology. It is an epileptic disease whose first epileptic seizure begins from the age of 25 years.

Incidence defines the number of new cases appearing in a defined population during a given period of time, usually a year. It is expressed by a rate related to 100,000 inhabitants/year.

In Algeria, the incidence of epilepsy is 56/100,000 (M. Ait-Kaci-Ahmed, 1980) [1].

H. Tiliouine, 2006 [2], in a survey by the Ministry of Health in Algeria, found a figure of 190/100,000 inhabitants.

In four epidemiological surveys (Loiseau et al, 1990 [3]; Jallon et al, 1997 [4]; Jallon et al, 1999 [5]; Mignard et al, 2009 [6]), the incidence of seizures epilepsy in the general population also shows a bimodal distribution with high rates in the first five years. Then a low-level stabilization in adulthood (25 - 100/100,000) in people aged 25-50, to gradually increase in subjects over 60 (104 to 128/100,000), then drastically after 70 years old (140 - 300/ 100000).

The incidence of late-onset epilepsy according to Hauser et al, 1993 [7], in Rochester, Minnesota, from 1935 to 1984 is represented as follows: 30 cases per 100,000 inhabitants between the ages of 25 and 64, and around 100-170 cases per 100,000 inhabitants for patients over 65 years of age.

In the survey conducted in Iceland by (Olafsson et al, 2005) [8], the incidence of epileptic seizures also presents a bimodal distribution, with a low rate in subjects whose age group is between 25-64 years (31.1 to 48.3 / 100000). Then increases gradually from the age of 65 (70.5/100,000), and dramatically after the age of 75 (168.5/100,000).

II. Material And Methods

The study population includes all Algerian patients whose age of onset of the first seizure is 25 years or more, recruited at ALI AIT IDIR Hospital in Algiers.

A. Inclusion criteria:

1. The age of the patients must be greater than or equal to 25 years at the time of inclusion.
2. Patient presenting with his first epileptic seizure at the age of 25 years or older.
3. Clinically and electrically confirmed diagnosis of epilepsy.

B. Exclusion criteria:

1. Age less than 25 years

C. Course of the study:

1. Method of recruitment:

Patient recruitment was carried out:

- In neurology emergencies, epilepsy consultation, hospitalization services (three in number) of neurology of the EHS ALI AIT IDIR in Algiers.
- At the EEG laboratory of the EHS ALI AIT IDIR in Algiers.
- Neurosurgery emergencies, neurosurgery consultation, hospitalization services (three in number) of neurosurgery of the EHS ALI AIT IDIR in Algiers.
- From patients referred by medical practitioners and neurologists from all the wilayas of Algeria.

2. Total duration of the study:

Patient recruitment benefited from two cohorts:

- One in a retrospective study over 6 years (from January 1, 2008 to December 31, 2013).
- The other in a prospective study over 3 years (from January 1, 2014 to December 31, 2016).

III. Results

Our study population includes 336 patients, recruited during the period from January 2008 to December 2016. This figure corresponds to the number of patients selected according to the inclusion criteria.

General characteristics of the population:

1. Annual number of patients during the study period:

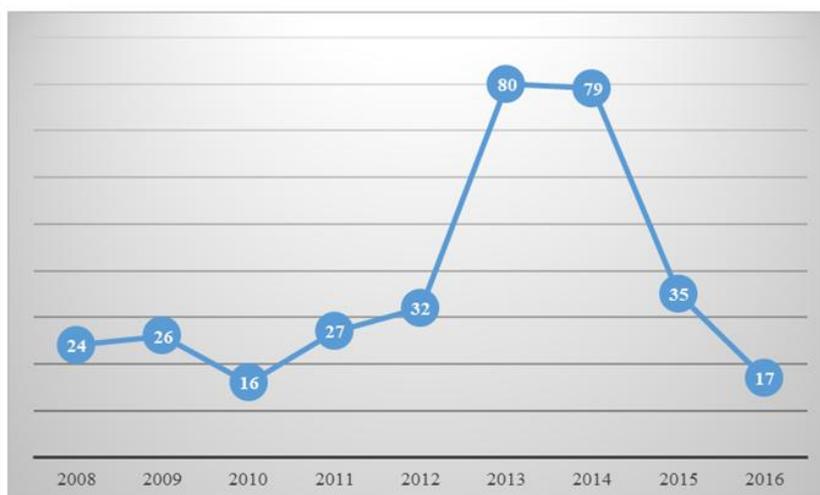


Figure 1. Annual number of patients with late-onset epilepsy during the study period

This table shows a peak in recruitment during the years 2013 and 2014, which has not received any particular explanation.

2. Demographics

2.1 Breakdown of patients by gender

The two sexes were similar in their distribution with 175 men and 161 women, therefore a sex ratio of 1.08 in favor of the male sex.

Among our 336 patients, 175 are men (52.1%) and 161 are women (47.9%).

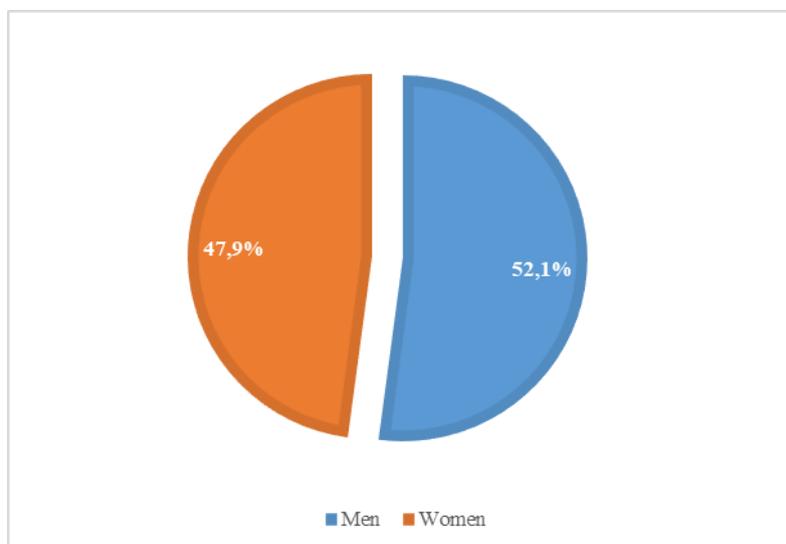


Figure 2. Distribution of patients by gender

2.2 Distribution by age

This data is particularly important since it shows the variation in the incidence of epilepsy with increasing age.

Table 1. Distribution of patients by age group

	Cases	%
25-29 years	45	13,4
30-34 years	47	14
35-39 years	48	14,3
40-44 years	28	8,3
45-49 years	28	8,3
50-54 years	24	7,1
55-59 years	25	7,4
60-64 years	25	7,4
65-69 years	19	5,6
70-74 years	21	6,2
75-79 years	16	5
80 years and over	10	3
Total	336	100 %

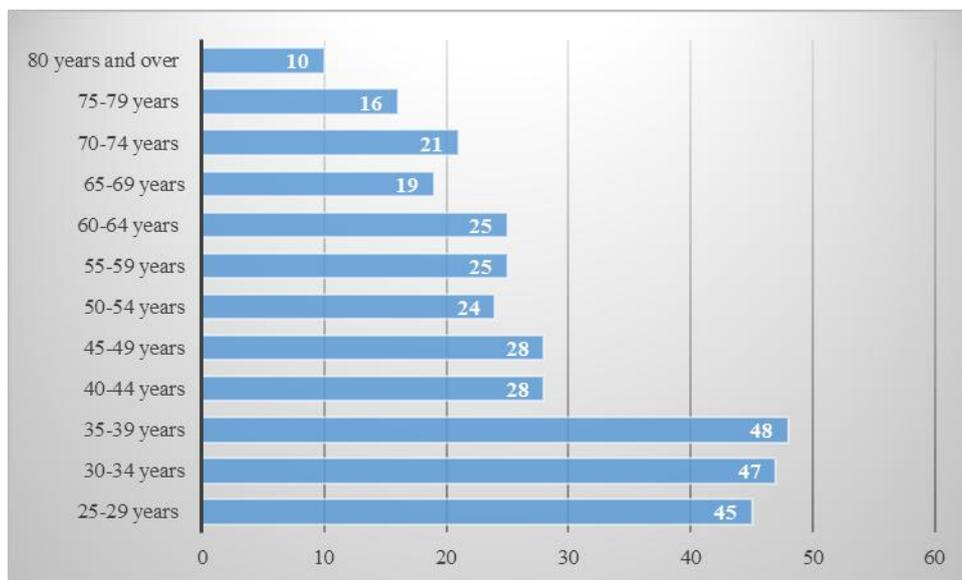


Figure 3. Distribution of patients by age group

We thought it would be interesting to cross-reference the two data: age at onset and gender.

2.3 Breakdown by age and gender

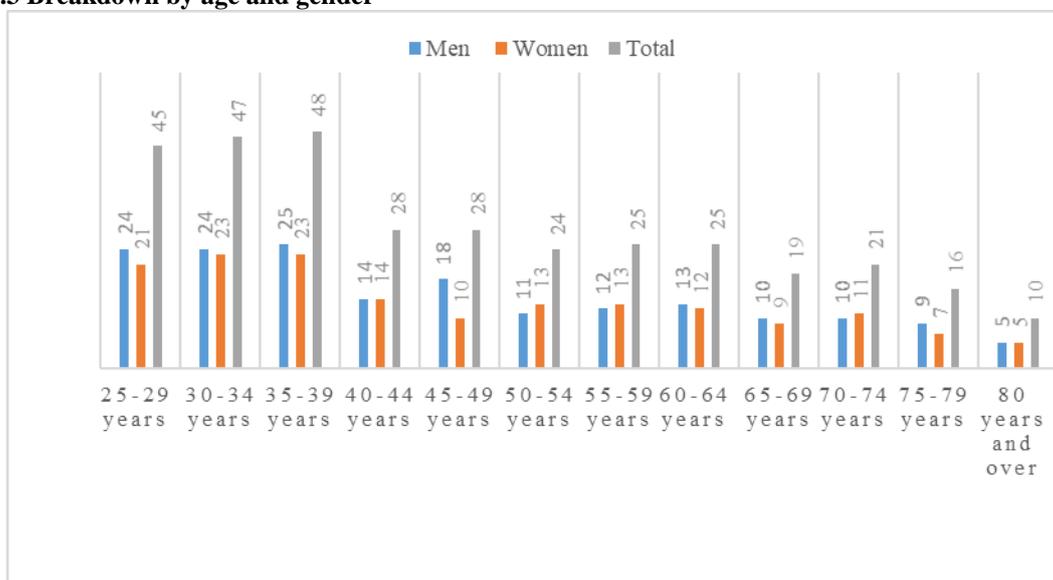


Figure 4. Distribution of patients according to gender and age groups

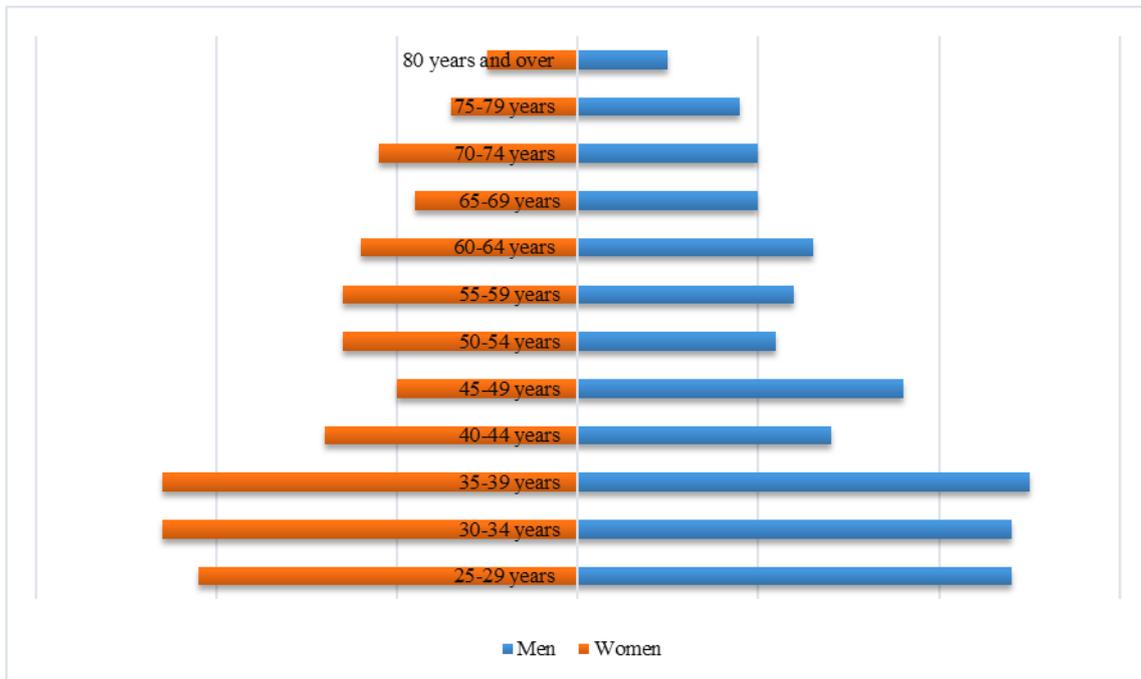


Figure 5. Age pyramid

The age pyramid clearly shows the evolution of the incidence with advancing age. It involves taking into account the structure of the population.

2.4 Breakdown of patients by geographical origin:

Unsurprisingly, the majority of our patients were from the wilaya of Algiers (63% of cases).

Table 2. Distribution of patients with late-onset epilepsy according to geographical origin

Geographical origin	Cases	%
Wilaya of Algiers	212	63
Eastern wilayas	55	16,4
Western wilayas	56	16,7
Southern wilayas	13	3,9
Total	336	100

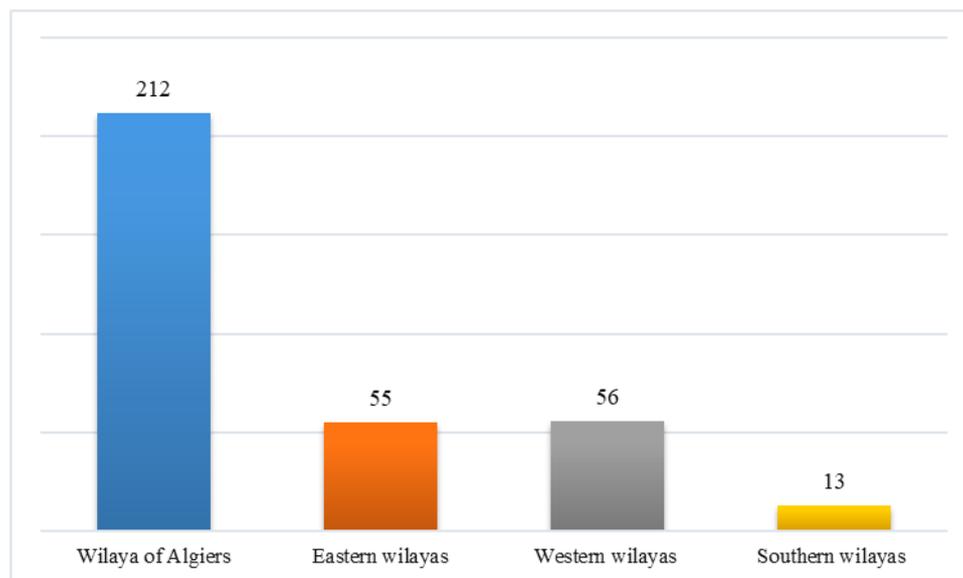


Figure 6. Distribution of patients according to geographical origin

IV. Discussion

The average age in our study was 47.6 years, with limits ranging from 25 to 85 years. In the different studies, the average age varies from 20 to 53 years. This difference could be explained by the choice of the age of onset of the first late seizure and the structure of the population of the country concerned. Among our 336 patients 175 are men 52.1% and 161 women 47.9%. Fifty-two percent of our patients are male with a sex ratio of 1.08. This difference could be explained by the importance of vascular pathology in men. This agrees with data from the literature, where the sex ratio of epilepsy is little different from 1, with nevertheless a slight male predominance.

Our results are consistent with data from the literature of GCY Fong et al, 2003 [9], and Christian Napon et al, 2009 [10].

Our results are however different from the studies of (David Otega Riveo et al, 2003 [11]; Ewan Hunter et al, 2012 [12]; Pedro J. Serrano Castro et al, 2015 [13]; Elina Melikyan et al, 2012 [14]).

Table 3. Literature review of demographic data

Study	Country	Cases	Sex ratio	Average age
José Luis Pérez Lopez et al, 1985	Spain	250	ND	52
ECY Fong et al, 2003	Hong Kong	736	1.33	40.8
David Ortega Riveo et al, 2003	Ecuador	32	0.68	53
Christian Napon et al, 2009	Burkina Faso	111	2.17	25.7
Sardar MH et al, 2011	Bengladesh	106	ND	20
Ewan Hunter et al, 2012	Tanzania	568	0.98	ND
Elina Melikyan et al, 2012	Russia	208	0.70	31.49+/-13.20
Perdo J. Serrano-Castro et al, 2015	Spain	24	0.57	44.13
Our series	Algeria	336	1.08	47.69

ND : Not Documented

63% of the patients in our study come from the wilaya of Algiers, 16.7% from the western wilayas, 16.4% from the eastern wilayas, and finally 3.9% from the southern wilayas.

Our results agree with the literature data reported by M.Ait-Kaci-Ahmed, 1980 [1], where he found that most patients come from the wilaya of Algiers (70% of cases).

V. Conclusion

Our study population includes 336 patients, recruited during the period from January 2008 to December 2016. These patients were selected according to the inclusion criteria.

Patient recruitment benefited from two cohorts: One in a retrospective study over 6 years (from January 1, 2008 to December 31, 2013). The other in a prospective study over 3 years (from January 1, 2014 to December 31, 2016).

The average age of our patients was 47.6 years with limits ranging from 25 to 85 years. The sex ratio was 1.08 in favor of the male sex.

Among our 336 patients, 175 are men (52.1%) and 161 are women (47.9%).

There is a variation in the incidence of epilepsy with increasing age. The age pyramid shows the evolution of the incidence with advancing age. It involves taking into account the structure of the population.

During the study period, 336 cases of late-onset epilepsy were diagnosed; it is a proportion of late onset epilepsy of 34% compared to all epilepsies.

The majority of our patients were from the Wilaya of Algiers (63% of cases). 16.7% from the western wilayas, 16.4% from the eastern wilayas, and 3.9% from the south of the country.

References

- [1]. **M. Ait-Kaci-Ahmed**, Approche épidémiologique de l'épilepsie dans la région d'Alger. *Thèse de doctorat d'état*. Alger. 1980.
- [2]. **Tiliouine, H.** Stability and change in national and personal well-being in Algeria: a case study of developing country in transition. In: V.
- [3]. Moller, D. Huschaka (Eds.) Quality of life and the millennium challenge: advances in quality-of-life. 1st ed. *Springer The Netherlands*. 2006, 115–122.
- [4]. **Loiseau J, Loiseau P, Guyot M, Duche B, Dartigues JF, Aublet B.** Survey of seizure disorders in the French southwest. I. Incidence of epileptic syndromes. *Epilepsia*. 1990, Vol.31(4) :391-6.
- [5]. **Jallon P.** Epilepsy in developing countries. *Epilepsia*. 1997, Vol. 38(10) :1143-511997.
- [6]. **Jallon P, Smadja D, Cabre P, et al.** EPIMART: prospective incidence study of epileptic seizures in newly referred patients in a French Caribbean island (Martinique). *Epilepsia*. 1999, Vol. 40 (8):1103–1109.
- [7]. **Mignard C, Tchalla E, Marin B, Tabailoux E, Mignard D, Jallon P, Preux PM.** Incidence of newly diagnosed epileptic seizures in a French South Indian Ocean Island, La Réunion (EPIREUN). *Epilepsia*. 2009, Vol. 50(10):2207-12.
- [8]. **Hauser WA, Annegers JF, Kurland LT.** Incidence of epilepsy and unprovoked seizures in Rochester, Minnesota: 1935-1984. *Epilepsia*. 1993, Vol. 34(3) :453-68.
- [9]. **Olafsson E, Ludvigsson P, Gudmundsson G, Hesdorffer D, Kjartansson O, Hauser WA.** Incidence of unprovoked seizures and epilepsy in Iceland and assessment of the epilepsy syndrome classification: a prospective study. *Lancet Neurol*. 2005, Vol. 4(10):627-34.
- [10]. **GCY Fong, W. Mak, TS. Cheng, KH. Can, JKY. Fong, SL. Ho.** A prevalence study of epilepsy in Hong Kong. *Hong Kong Med J*. 2003, Vol. 9: 252-7.
- [11]. **Christian Napon, Yacouba Tamboura, Jean Kabore.** Epilepsie des sujets de plus de 14 ans au centre hospitalier universitaire de Ouagadougou (Burkina Faso). *Epilepsies*. 2009, Vol. 21(1) : 93-7.
- [12]. **David Ortega Rivero, Maria Gabriela Acuna Chong, Natalia Orellana Manzano.** Factores etiologicos mas frecuentes de epilepsia tardia. *Revista Medicina*. 2003, Vol. 9(3).
- [13]. **Hunter Ewan, Rogathi J, Chigudu S, Jusabani A, Jackson M, McNally R, Gray W, Whittaker RG, Iqbal A, Birchall D, Aris E, Walker R.** Prevalence of active epilepsy in rural Tanzania: a large community-based survey in an adult population. *Seizure*. 2012, Vol 21(9):691-8.
- [14]. **Serrano-Castro PJ, Mauri-Llerda JA, Hernández-Ramos FJ, Sánchez-Alvarez JC, Parejo-Carbonell B, Quiroga-Subirana P1,**
- [15]. **Vázquez-Gutierrez F, Santos-Lasaosa S, Mendez-Lucena C, Redondo-Verge L, Tejero-Juste C, Morandeira-Rivas C, Sancho- Rieger J, Matías-Guiu J.** Adult Prevalence of Epilepsy in Spain: EPIBERIA, a Population-Based Study. *Scientific World Journal*. 2015, ID 602710.
- [16]. **Melikyan E, Guekht A, Milchakova L, Lebedeva A, Bondareva I, Gusev E.** Health-related quality of life in russian adults with epilepsy: the effect of socio-demographic and clinical factors. *Epilepsy Behav*. 2012, Vol. 25(4): 670.
- [17]. **El-Tallawy HN, Farghaly WM, Shehata GA, Abdel-Hakeem NM, Rageh TA, Abo-Elftoh NA, Hegazy A, Badry R.** Epidemiology of epilepsy in New Valley Governorate, Al Kharga District, Egypt. *Epilepsy Res*. 2013, Vol. 104(1-2):167-74.
- [18]. **R. Sridharan, K. Radhakrishnan, P.P. Ashok, and M.E. Mousa.** Epidemiological and clinical study of epilepsy in Benghazi, Libya. *Epilepsia*. 1986, Vol. 27(1) : 60-65.
- [19]. **Loiseau J, Loiseau P, Guyot M, Duche B, Dartigues JF, Aublet B.** Survey of seizure disorders in the French southwest. I. Incidence of epileptic syndromes. *Epilepsia*. 1990, Vol.31(4) :391-6.
- [20]. **Lars Forsgren, Gosta Bucht, Sture Eriksson and Lars Bergmark.** Incidence and clinical characterization of unprovoked seizures in adults: A prospective population-based study. *Epilepsia*. 1996, Vol. 37(3) : 224-229.
- [21]. **Rwiza HT, Kilonzo GP, Haule J, Matuja WB, Mteza I, Mbena P, Kilima PM, Mwaluko G, Mwang'ombola R, Mwaijande F, et al.**
- [22]. Prevalence and incidence of epilepsy in Ulanga, a rural Tanzanian district: a community-based study. *Epilepsia*. 1992, Vol. 33(6):1051- 6.
- [23]. **Annegers JF, Dubinsky S, Coan SP, et al.** The incidence of epilepsy and unprovoked seizures in multiethnic, urban health maintenance organizations. *Epilepsia*. 1999, Vol. 40(4) :502–506.
- [24]. **Banerjee PN, Filippi D, Allen Hauser W.** The descriptive epidemiology of epilepsy-a review. *Epilepsy Res*. 2009, Vol. 85(1) :