



## Original article

# Prevalence of idiopathic epilepsy among school children in Gharbia Governorate, Egypt

Azza Kamal Alshahawy<sup>a</sup>, Amira Hamed Darwish<sup>a,\*</sup>, Safynaz Elsaid Shalaby<sup>b</sup>, Wegdan Mawlana<sup>c</sup>

<sup>a</sup> Pediatric Neurology Unit, Department of Pediatrics, Tanta University Hospital, Faculty of Medicine, Tanta, Egypt

<sup>b</sup> Department of Public Health and Community Medicine, Tanta University Hospital, Faculty of Medicine, Tanta, Egypt

<sup>c</sup> Pediatric Cardiology Unit, Department of Pediatrics, Tanta University Hospital, Faculty of Medicine, Tanta, Egypt

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## Abstract

**Background:** Epilepsy is one of the most common neurological disorders among children. Data about its prevalence in Egypt is limited. Our aim was to study the prevalence of idiopathic epilepsy among school children in Gharbia governorate, Egypt.

**Subjects and Methods:** A Cross-sectional school-based survey study was conducted; a validated screening questionnaire was distributed among urban and rural primary and preparatory school children. Students with suspected epilepsy were subjected to clinical evaluation, Electroencephalogram (EEG), and neuroimaging.

**Results:** 9545 students completed the questionnaire, of whom 69 children proved to have idiopathic epilepsy. The lifetime prevalence of idiopathic epilepsy among school students aged 6–14 years was 7.2/1000. Higher prevalence was reported in males (7.7/1000) and in children from urban areas (8.25/1000). Generalized seizures were observed in 56.5% of the children with epilepsy, whereas focal seizures were present in 43.5%. Thirty-four (49.27%) children were diagnosed with specific childhood epileptic syndrome: 25 children had benign childhood epilepsy with centrotemporal spikes and nine children had typical childhood absence epilepsy. Treatment gap is around 12.5% in the studied children. Family history of epilepsy and parental consanguinity were evident in 73.9% and 21.7% of the epileptic children, respectively. The odds ratio for idiopathic epilepsy in children with family history of epilepsy was 23.9.

**Conclusion:** The prevalence of idiopathic epilepsy among school students aged 6–14 years in Gharbia Governorate was 7.2/1000. The reported prevalence is similar to the prevalence of epilepsy in other Arab countries, but lower than the prevalence in Upper Egypt and in most developing countries.

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**Keywords:** Epilepsy; Prevalence; Children; Egypt

## 1. Introduction

Childhood epilepsy is one of the most important and prevalent neurological disorders among children in both developing and developed countries. Previous studies reported that the prevalence of epilepsy in children

\* Corresponding author at: Pediatric Neurology Unit, Pediatrics, Tanta University Hospital, Faculty of Medicine, 12 Farrag Street, 3111 Tanta, Egypt.

E-mail address: [amira.darwish@med.tanta.edu.eg](mailto:amira.darwish@med.tanta.edu.eg) (A.H. Darwish).

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ranges from 3.2 to 5.5/1000 in developed countries and 3.6–44/1000 in developing countries [1].

Epilepsy has its impact on both physical and mental health of children. Children with epilepsy may suffer from behavioral and psychiatric disorders, social isolation and school absenteeism due to negative attitude of people and social stigmatization [2].

Epidemiological studies of epilepsy provide good understanding about the burden of epilepsy in childhood, which would be helpful in planning health services for children with epilepsy in Egypt. Information from epidemiological studies also assist in generating hypotheses regarding the risk factors of epilepsy, thus guiding new research on the etiology and prevention of epilepsy [1].

There are insufficient data about the magnitude of idiopathic epilepsy among Egyptian children [3]. Previous studies included both adults and children and were limited to Upper Egypt, where health care facilities and socioeconomic criteria differ from those of other areas of Egypt [4,5]. The aim of this study was to assess the prevalence of idiopathic epilepsy among school children in Gharbia Governorate, Egypt.

## 1.1. Subject and Methods

### 1.1.1. Study setting

The study was conducted in selected rural and urban schools in Gharbia Governorate. Gharbia Governorate is located in the center of Nile Delta of Lower Egypt and its estimated population in the last census in 2014 was 46,481,597. Tanta is the capital, 90 km north of Cairo. Egypt is divided into 27 governorates in four geographical regions: Urban governorates, Lower Egypt, Upper Egypt and Frontier. Lower Egypt is the Nile River Delta in the Northern region of Egypt, while Upper Egypt is the Nile River valley, located from the south of Cairo to Aswan in the southern of Egypt. Lower and Upper Egypt contain both rural and urban areas, whereas the urban governorates only contain urban areas.

### 1.1.2. Population of the study

School students aged 6–14 years attending primary and preparatory schools in Gharbia Governorate.

### 1.1.3. Type of the study

Cross-sectional school-based survey study.

### 1.1.4. Sample size calculation

The sample size was calculated using the following formula:

$$n = \frac{t^2 \times p(1-p)}{m^2} \quad (1)$$

where:

n = required sample size

t = is the critical value for alpha. When alpha = 0.05, t is 1.96.

p = estimated prevalence of idiopathic epilepsy

m = margin of error at 5% (standard value of 0.05)

The prevalence of idiopathic epilepsy reported in previous studies was 9.5 and ranged from 7.34 to 11.6/1000 in the general population [4,5]. A prevalence of 10/1000 (1%) was considered, so  $n = (1.96)^2 \times 0.01(0.99)/(0.05)^2 = 1521$ . The calculated sample size of 1521 subject represents the minimal required sample.

### 1.1.5. Sampling

Cluster sampling technique was used to include one educational administrative region of the eighth sectors of the governorate. Tanta city was selected purposively. It contains two regions (east & west); east administrative region was randomly chosen and 12 schools (six urban schools and six schools from rural areas related to Tanta City) were selected from the list of all schools. From each school, classes from each grade were chosen randomly (12 classes from each school); each class contains approximately 50–60 students. The study was conducted during the academic year 2013–2014 (from 1 October 2013 until the end of March 2014).

### 1.1.6. Inclusion criteria

School students aged 6–14 years, regularly attending schools without absenteeism were included in the study.

### 1.1.7. Exclusion criteria

Special schools for intellectually disabled children or children with hearing or visual impairment were not included in the study. Also, students with an abnormal neurological examination or diagnosed with an organic brain disease causing convulsions were excluded from the study.

### 1.1.8. Tools of the study

A pre-designed questionnaire sheet was used to collect data, including demographic data; parents' occupations and educational levels; the student's medical history, with a focus on any history of convulsions or use of antiepileptic drugs (AEDs) to identify any child with a history suggestive of epilepsy; and a family medical history, particularly for epilepsy. The screening questionnaire was validated on a sample of 50 epileptic children and 50 age- and sex-matched normal children recruited from the outpatient pediatric clinic. The sensitivity and specificity of the questionnaire were 96% and 80%, respectively.

### 1.1.9. Methods

- a) Official permission was obtained from Tanta administration of educational affairs before conducting the study, and then information about

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