Epileptic Seizures and Epilepsy in Patients with Multiple Sclerosis

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Abstract: *Purpose*: Epilepsy and epileptic seizures occur more frequently in patients with multiple sclerosis (MS). In this patient population most often are reported complex partial and secondarily generalized tonic-clonic seizures. The aim of this study was to analyze the clinical and some demographic characteristics of patients with epileptic seizures or epilepsy and MS who have sought specialized medical care in the area of Sofia, Bulgaria.

Methods: A prospective study with 67 consecutive cases of patients with definite MS which was realized at a Clinic of neurology of a University hospital. In all patients a disease history was reviewed with a focus on epileptic seizures and other motor phenomena, as well on epilepsy.

Results: Epileptic seizures were identified in 4 (6.0%) patients in our group. Epilepsy was identified as well in 4 (6.0%) patients. Of these, we identified simple focal motor seizures, simple focal sensory seizures, and generalized tonic-clonic seizures. Paroxysmal activity on electroencephalography (EEG) was registered in three patients.

Conclusions: Our locally performed study corroborates the overall opinion that epilepsy and epileptic seizures are more frequent in patients with MS than in the general population. The seizure semiology was not different than previously reported in other MS and epilepsy studies. We did not identify any patient with an epileptic seizure as an initial or the only presentation of MS.

Keywords: Epilepsy, epileptic seizures, multiple sclerosis.

INTRODUCTION

The incidence of epilepsy in the general population is between 0.27 and 1.7% [1]. It is estimated that about 65 million people worldwide suffer from epilepsy [2]. According to the Bulgarian National Consensus for Diagnostic and Treatment of Epilepsy the prevalence of epilepsy in Bulgaria is 1% and incidence rates are between 20 and 70 cases per 100 000 persons [3]. The overall incidence rate of MS is reported to be 3.6 cases per 100000 persons, and it is considered to be more frequent in women and in regions with greater distance from the equator, although this tendency seems to be less remarkable in the recent years [4]. Epidemiological studies in Bulgaria conclude that the prevalence of multiple sclerosis in the country is 44.5/100 000 and incidence 1.03/100 000 of the population [5].

Co-morbidities such as epilepsy is more common in patients with multiple sclerosis (MS) and the frequency varies in the literature between 2.3% and 3,2% [1, 6, 7]. The overall opinion is that epilepsy is three to six times more frequent in patients with MS [7-9]. Epilepsy is usually diagnosed later in the course of MS, although episodes of single or grouped seizures can be observed [10]. Although the pathophysiological connection between MS and epilepsy has not yet been elucidated, one possible explanation could be that the lesions of demyelination may act as epileptiform foci [6, 11]. The overall prognosis of epilepsy in the course of MS is good [10,12,13], although the manifestation of` MS seizures as an initial symptom of MS could create differential diagnostic difficulties [14].

Epileptic seizures occur with greater frequency in multiple sclerosis (MS) patients than in the general population [10]. It is generally accepted that epileptic seizures are more common in MS patients, and in rare cases, MS can be clinically presented only with epileptic seizure [10, 15, 16]. This indicates the presence of etiological link between MS and epilepsy [17]. Most often are reported complex partial and secondarily generalized tonic-clonic seizures [1, 10, 18]. Epileptic seizures can occur at any time in the course of MS, but are more common in the early stages of the disease [19]. It is assumed that the later the epileptic seizures occur in the course of MS, the more likely is that their etiology is not associated with MS [20]. At present, it is still difficult to describe precisely the clinical characteristics of epileptic seizures in MS, the moment of their occurrence in the course of the underlying disease, and the frequency of their relapses. This is largely due to a lack of understanding of the pathogenetic mechanisms of occurrence of seizures and epilepsy in MS [17]. Since there is enough specialized information on this topic the main objective of this study was to clarify the following issues:

- To analyze the clinical and some demographic characteristics of patients with epileptic seizures, epilepsy and MS.

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- To compare the results from this locally performed study with previous data.

The results of this study should give additional information about the clinical and epidemiological features of epileptic seizures and epilepsy in MS on a local level which is important in terms of comparison between regional and overall findings on this certain issue.

MATHERIALS AND METHODS

This prospective study was performed on inpatients, admitted to a University hospital with Neurology clinic in Sofia Bulgaria as well on ambulatory outpatients followed during a three-year period between 2010 and 2013. From a total number of 185 examined patients with a cerebro-spinal multiple sclerosis 67 patients gave their consent to participate in the study. All patients were divided into four groups depending on the clinical course and the dominant clinical manifestation of multiple sclerosis, as well as the duration of the disease. The patient history was reviewed in details with a focus on presence of epileptic seizures or other paroxysmal phenomena as well as presence of epilepsy. The exact clinical presentation of the seizures, their frequency and also their appearance in the course of MS was reviewed. Additionally, conventional EEG were recorded and assessed mainly for the presence of paroxysmal epileptiform activity.

All gathered data were analyzed statistically with a specialized statistical software (SSPS, version 13.0). For the purpose of this study a descriptive statistics was used.

RESULTS

Demographic Data

A total number of 67 patients were studied, aged between 21 and 57 years with a mean age of 38,1 (SD = 9,5) years. Of these 42 (62.7%) women, average age of 38,6 (SD = 10,0) years and 25 patients (37.3%) were male, mean age of 37,2 (SD = 18,7) years. Minimum/maximum age was both 21 for women and 57 years for men 25 and 55 years respectively (Table **1**).

Table 1: Distribution of the Patients by Age

Age	N	Mean	SD	Median	Min	Max
Total	67	38.1	9.5	37.0	21	57
Female	42	38.6	10.0	37.5	21	57
Male	25	37.2	8.7	36.0	25	55

The disease duration was within 1 and 32 years with an average for women 6,5 (SD = 6,5) years and for men 6,9 (SD = 6,8) years.

Epileptic Seizures

Epileptic seizures were observed in 4 (6.0%) MS patients. The age of the patients was between 28 and 57 years (SD = 14.2). Three patients were female and one was patient male. One patient (1.5%) had simple focal motor seizures, one patient (1.5%) was with focal sensory seizures, one patient (1.5%) had generalized tonic-clonic seizures, and one patient (1.5%) was with simple focal motor seizures and generalized tonic-clonic seizures (Figure **1**).

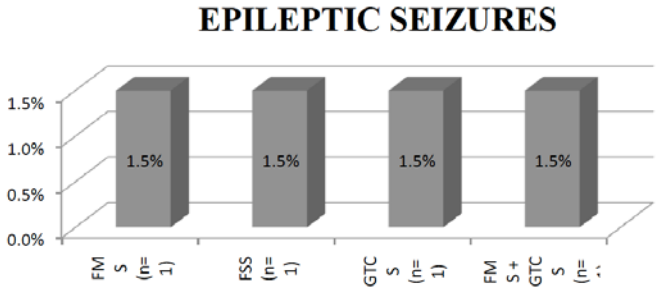

Figure 1: Disposition of patients according to the type of epileptic seizures. FMS – focal motor seizures; FSS – focal sensory seizures; GTCS – generalised tonic-clonic seizures.

The observed epileptic seizures showed no specific clinical presentation that could be attributed to the presence of multiple sclerosis. In no one of the patients epileptic seizure was the only symptom of MS. In patients with relapsing MS course we did not observe epileptic seizure to be an initial symptom of relapse. Two patients had disability, related to MS and measured with Expanded Disability Status Scale (EDSS), greater than 6, which indicates greater disability. In these patients later in the course of the disease occurred fatal status epilepticus.

Symptomatic epilepsy apparently due to MS was diagnosed in the same aforementioned 4 patients (6.0%). The course of MS patients is as follows: 1 patient - relapsing remitting; 1 patient – primary-progressive MS; 1 patient - secondary-progressive MS; 1 patient – relapsing-progressive MS. The duration of MS was between 2 and 8 years (SD = 2,5). In all patients, epilepsy arose in the course of MS. A tendency for correlation was found between the presence of epilepsy and overall MS disability. In the

study group no significant correlation was found between the type of epilepsy and the course of MS, which might be due to the small patient sample. Future studies focused on this problem with greater patient cohorts will be needed.

From the patients with epileptic seizures and epilepsy the EEG studies showed paroxysmal epileptiform discharges in 3 (75%) patients, and one patient did not have any paroxysmal findings.

DISCUSSION

Despite the fact that this study had some limitations referring the design and patient cohort there are few important issues that should be discussed. The frequency of epileptic seizures, identified in our group corresponds with the results of Sokic [16], and is a little bit higher than the results of other authors [10, 21]. This result confirms previously published data, namely that epileptic seizures are more common in MS [10, 15, 16].

We did not observe in any of the patients an epileptic seizure as an initial or a solitary manifestation of MS relapse. In all patients epileptic seizures occurred during the course of MS. Our data did not confirm partial complex seizures to be one of the most seen seizure forms in MS a pointed in other previous studies [1, 10, 18]. No other motor non-epileptic phenomena were observed in our patient group as described by some other authors [22]. The incidence of epilepsy in our group of patients was 6% - a little bit higher than the mentioned in the literature [1, 6, 7]. Our results confirm the statement that epilepsy is three to six times more frequent than in patients with MS [7-9]. We found a little bit higher prevalence of epilepsy in women than in men and this result is to a certain degree in conflict with what some authors have found previously [23]. In all patients epilepsy was diagnosed in the course of MS which suggests that epilepsy could be a symptomatic result of the pathology related to MS.

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