Original Research Article

Clinical and paraclinical aspects of febrile convulsions in children at the Ziguinchor peace hospital: documentary study.

Abstract

Introduction: febrile seizures are seizures associated with fever in children. They represent a frequent reason for consultation in pediatric emergencies. Febrile convulsions are often qualified as benign pathologies but they are a source of concern, explaining the number of tolls imposed on these children. The aim of the study was to report the practice to a hospital in Senegal.

Materials and methods: this is a retrospective study of children's records, from January 1, 2015 to January 31, 2020. Were included, patients aged less than or equal to 5 years, hospitalized in the pediatric department of the Ziguinchor Peace Hospital, for a febrile convulsion. Newborns and children with psychomotor development abnormalities were excluded. We have studied the clinical and etiological data.

Results: we collected 85 (51 boys, 34 girls) cases of febrile convulsions, ie a hospital frequency of 10,6%. The mean age of the patients was 23,6 months, peaking in infants 12 to 18 months. The mean temperature was 38,8° C and the seizure was tonic-clonic in 64,7%. We noted 57 cases of simple febrile convulsions (67,1%) and 28 cases of complicated febrile convulsions (32,9%). The etiology of fever was dominated by otorhinolaryngologic infections (42,4%); malaria (18,8%) and bronchopulmonary infections (08,2%). The average length of hospital stay was 02,8 days. We deplored two deaths (02,4%).

Conclusion: febrile convulsions are common in children under 5 years old. They are secondary to respiratory tract infections and malaria.

Keywords: febrile convulsion, child, Ziguinchor.

INTRODUCTION

Febrile seizures (FS) are seizures that occur in the context of fever, not caused by infection of the central nervous system, or by other defined causes such as metabolic disorders. It occurs in an infant or child who has no history of neonatal seizures or non-febrile seizures [1]. Furthermore, there is controversy over the definition of a FS, with regard to the age of onset, the criteria for the differences between simple FS and complicated FS [2, 3]. To date There are three definitions of FS, officially published [4, 5, 6]. FS is a very common pediatric problem around the world. Depending on the regions considered, 2 to 5% of the general population present at least one FS before the age of 5 years [7]. In Africa and particularly in Senegal there are no data on the frequency in relation to the general population. In hospitals, it is a frequent reason for consultation in pediatric emergencies [8, 9, 10]. Most often FS are qualified as benign pathologies but they are a source of concern for parents and caregivers, explaining the number of assessments imposed on these children. The objective of our study was to report the practice in a level 2 hospital in the southwest of Senegal in the event of FS in the child.

MATERIALS AND METHODS

1. Study framework

Our study took place in the pediatric department of the Ziguinchor Peace Hospital. The pediatric ward has an emergency room with a capacity of 6 inpatient beds. Pediatric emergencies are taken care of by medical staff, consisting of a university assistant pediatrician, and two other hospital practicing pediatricians.

2. Methodology

2.1. Type and period of study

This is a retrospective descriptive and analytical study on the files of children hospitalized in the pediatric department of the Ziguinchor Peace Hospital for a period of 5 years from January 1, 2015 to January 31, 2020.

2.2. Study population

The study concerned children aged less than or equal to 5 years hospitalized in the pediatric department of the Ziguinchor Peace Hospital.

Inclusion criteria: Were included in the study, all patients aged 1 to 60 months hospitalized for a febrile convulsion recognized by questioning and / or physical examination.

Non-inclusion criteria: Newborns, children followed for psychomotor development abnormalities and children with incomplete records were excluded from the study.

2.3. Definition of cases

Febrile seizure (FS): any convulsive seizure occurring in a child aged 1 to 60 months without a neurological history, during a fever with temperature greater than or equal to 38° C and unrelated to a neuromeningeal infection.

Simple FS

- Generalized crises.
- Duration <15 minutes.
- Age> 12 months
- Does not repeat within 24 hours
- Normal neurological examination

Complicated FS

Only one of these following criteria is sufficient to define a complicated FS.

- Focal seizures.
- Duration> 15 minutes.
- Age <12 months.

- Repetition of the seizure within 24 hours.
- Abnormal neurological examination.

3. Collection, data entry and analysis

For all the patients included, we collected epidemiological data (age and sex of the child; month and year of hospitalization); clinical data (personal or family history of febrile seizure, epilepsy; temperature on admission, time to onset of seizure compared to onset of fever; type, number, duration and topography of seizure; neurological signs and extra neurological associated with the crisis); para-clinical data (blood count, C-reactive protein, blood culture, cytobacteriological examination of urine and cerebrospinal fluid, rapid diagnostic test for malaria, chest x-ray, electroencephalogram); the etiological, therapeutic and evolutionary data. The data were analyzed on the Epi-info software version 3.5.4.

4. Ethical considerations

The rules of anonymity and confidentiality were respected.

RESULTS

1. Epidemiological data

During the 5-year period we admitted 95 patients for a febrile convulsion among 890 hospitalizations in the pediatric department of the Ziguinchor Peace Hospital, ie a hospital frequency of 10,6%. The number of febrile convulsion collected was 85 (51 boys and 34 girls); the rest of the files (10) were incomplete. The mean age of the patients was 23,6 months [3-60]; 76,5% of the patients were aged 6 to 36 months. The peak frequency of FS was observed in infants aged 12 to 18 months with 23,5% of cases. Figure 1 gives the distribution of FS according to the age of the child.

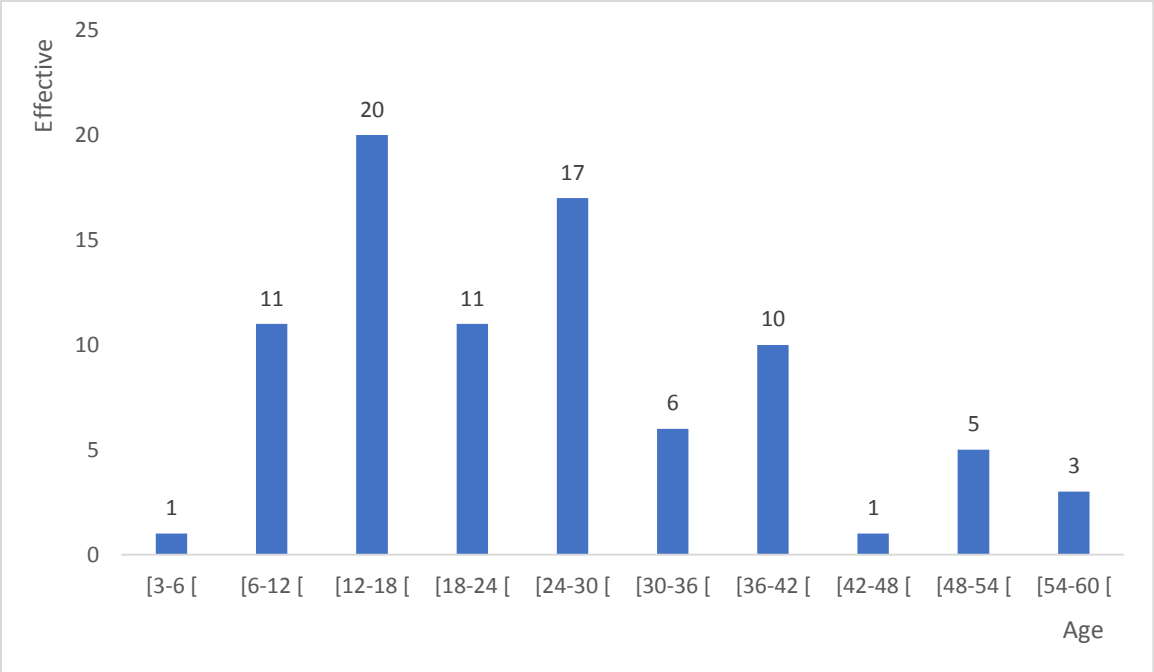


Figure 1 : distribution of febrile convulsions according to the age of child.

The frequency of febrile convulsion increased each year from 2015 to 2019, with the frequency peaking during the months of August and September. Figure 2 gives the distribution of febrile convulsions by month and year.

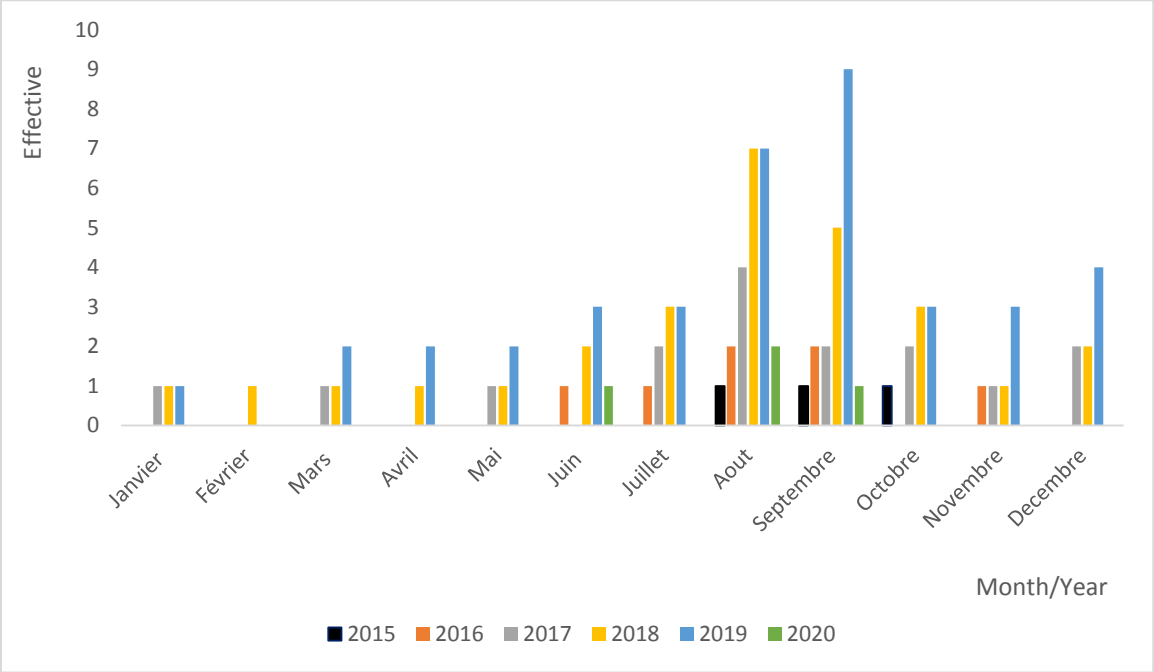


Figure 2 : distribution of febrile convulsions by month and year.

2. Clinical and para-clinical data

During our study, we noted that 9 patients (10.6%) had already presented a febrile seizure in the past. In these children, we noted that the risk factor that would be associated with recurrence was: the age of less than 12 months (01 child); the family history of FS (03 children); family history of epilepsy (02 children).

The inlet temperature averaged 38,8° C [38 – 40,2]; 50 patients (58,8%) had a temperature between 38,5 and 40° C.

The time interval between onset of fever and onset of seizure has only been specified in 29 cases. The average time to onset of seizure relative to fever is 4,10 hours [3 minutes - 48 hours].

In our study, we noted 57 cases of simple febrile seizures (67.1%) and 28 cases of complicated febrile seizures (32.9%). The seizure was tonic-clonic in 64,7%, tonic in 20,3% and clonic in 15%. Table I gives the distribution of patients according to the criteria for defining febrile convulsion taken in isolation.

Table I : distribution of patients according to the criteria of febrile convulsion.

Criteria		Effective	Percentage
Duration of seizure (Minute)	Less than 15	63	74,1
	Not specified	19	22,4
	Greater than 15	03	03,5
Number of crisis	1	63	74,1
	More than 1	22	25,9
Topography of crisis	Generalized	77	90,6
	Focal	08	09,4
Neurological	Normal	79	92,9

examination	Abnormal	06	07,1
Patient's age (Months)	Greater than 12	73	85,9
	Less than 12	12	14,1

The neurological and extra neurological signs associated with febrile seizures are shown in Table II.

Table II : distribution of patients according to neurological and extra neurological signs.

Associated signs	**Effective**	**Percentage**
Neurological		
Disorders consciousness	4	04,7
Meningeal syndrome	4	04,7
Hemiparesis	1	01,2
Orthorhinolaryngologica		
Nasopharyngitis	23	27,1
Angina	11	12,9
Otitis	2	02,4
Bronchopulmonary		
Condensation syndrome	5	05,9

Bronchial rales	2	02,4
Generals		
Paleur	7	08,2
Deshydration	3	03,5
Jaundice	2	02,4

The complete blood count was performed in 27 patients and returned with hyperleukocytosis greater than 10 000 leukocytes / mm^3 in 18 children. The C-reactive protein was performed in 23 patients and came back positive in 11 cases.

Bacteriological samples (blood culture in 2 patients, lumbar puncture in 27 patients, cytobacteriological examination of urine in 2 patients) were negative.

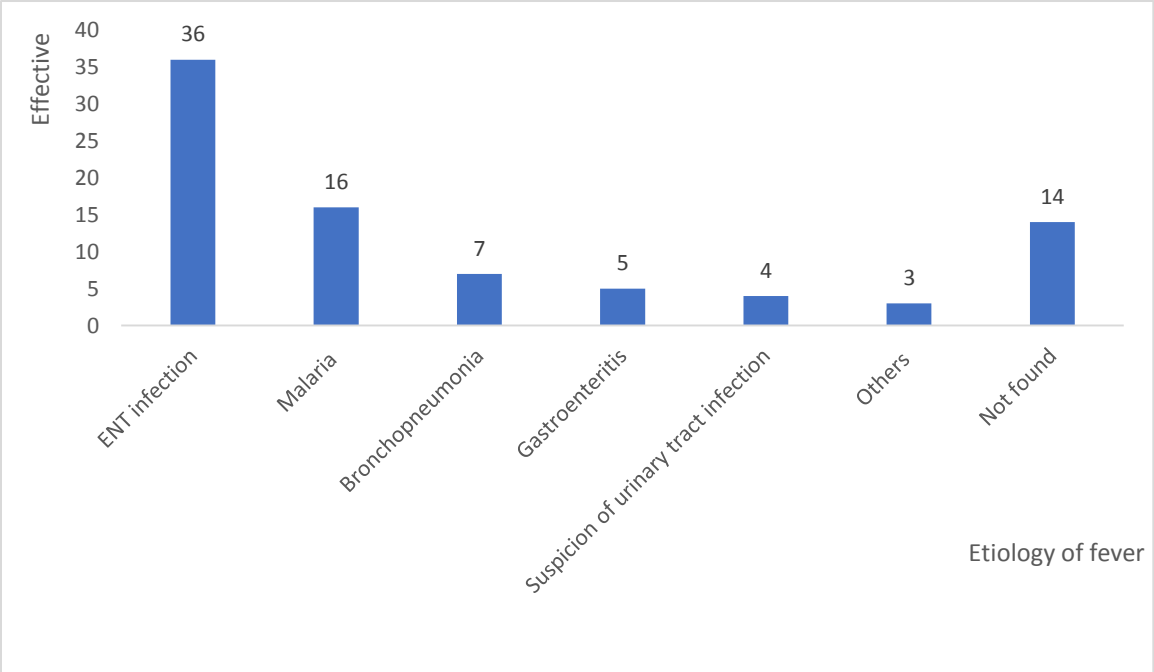
All patients had received a rapid diagnostic test for malaria and it was positive in 18,8% of cases (16 children).

Chest radiography was performed in 7 cases and returned abnormal in all cases. She found pneumonia in 4 cases, bronchial pneumonia in 1 case and bronchial syndrome in 2 cases.

The electroencephalogram (EEG) was not performed in any of the hospital patients. Twelve children (14,1%) had received an EEG after hospitalization. They all came back to normal.

3. Etiological data

The etiology of fever was dominated by otorhinolaryngologic infections (42,4%); malaria (18.8%). The etiology could not be traced in 16,5% of cases (14 children). Figure 3 shows the distribution of patients according to the etiology of the fever.



Others : skin abscess, teething sepsis.

Figure 3 : distribution of patients according to the etiology of the fever.

4. Therapeutic data

On admission, antipyretics were prescribed in 66 patients (77,6%), with paracetamol alone in 52 cases, and paracetamol - ibuprofen in 14 cases. Paracetamol was used rectally in one case on admission. Ibuprofen was used orally in all 14 patients. Anticonvulsants were prescribed in 24 patients (28,2%) and diazepam was the most prescribed (100%). It was used rectally in 3 children and intravenously in 21 children. The dose of diazepam was renewed, in combination with phenobarbital in 11 children. No patient was transferred to a pediatric intensive care unit. Antimalarials (18,8%) and antibiotics (71,0%) were the most widely used etiological treatments.

On discharge from hospital, paracetamol was prescribed as a discontinuous preventive treatment in 53 patients (62,4%). There was no continuous or intermittent anti-seizure therapy in the children.

5. Evolutionary and prognostic data

The average length of hospital stay was 2,8 days [1 - 10]; 57,6% (49 children) of cases had a day of hospitalization. The short-term course was marked by apyrexia and / or seizure arrest in 82,4% of cases (70 children) after 72 hours. We deplored two deaths (02,4%): one in a context of sepsis and another in severe malaria.

DISCUSSION

FS is a common disorder in children. During our study, FS represented 10,6% of pediatric hospitalizations, which is lower than the rates found by Dembélé et al., In Mali in 2014 (14,3%) or by Alao et al., In Benin in 2013 (16,9%) [9, 11]. But our frequency remained higher than that found by Nguefack et al., In Cameroon in 2008; by Mushagalusa et al., in DR Congo in 2015 [8, 12]. The hospital frequency of FS in developed countries varies from 2 to 5% [7]. The differences in frequency could result from the disparity of the selection criteria used in the different series. During our study, we noted seasonal variations in FS, with a peak in August and September. These peaks of hospitalization coincide with the period of resurgence of malaria in Senegal [13]. This seasonal variation was also observed by Diawara et al., In Mali [14]. Indeed the high frequency of FS is during the second half of the year. It is influenced by the tropical Sahelo climate which favors the transmission of malaria from June to November [7]. The increase in the number of cases of febrile convulsion over the years between 2015 and 2019, is correlated with the increase in the activities of our hospital structure. Indeed, the pediatric service started hospitalization activities with the opening of the hospital in 2015. The ages of our patients ranged from 3 to 60 months, with an average of 23.6 months. The peak frequency was observed in children aged 12 to 18 months. This remains in agreement with the data from the African literature, Nguefack et al., In Cameroon, Dembélé et al., In Mali, found respectively 36 and 24,6 months of mean age [8, 9]. The majority of the children in these studies were between 12 and 18 months old. In fact, most FS manifests itself during the second year of life [15, 16]. A relationship between age, degree of

brain maturation and fever has been established: there is an age-related neuronal hyperexcitability induced by fever in an immature brain [17].

In our study, 3 patients (03,5%) had a family history of FS. which is below the data in the literature, 10 to 50% [18]. Indeed, there is an important genetic predisposition; a 30 to 70% agreement was observed in monozygotic twins and 14 to 18% in dizygotic twins [19]. Some authors believe that this condition can be transmitted as an autosomal dominant trait, others have suggested a polygenic mode of inheritance. The risk of having a first CF is increased by 10–15% if a first-degree relative has had FS; it reaches 50% if it is a parent, brother or sister [20]. According to clinical criteria, 67,1% of simple FS were distinguished and 32,9% of complicated FS. This result is close to those reported by Nguefack et al., In Cameroon, by Mushagalusa et al., In DR Congo, but also by Kaputu Kalala Malu et al., In Belgium [8, 12, 21]. Furthermore, the high frequency of generalized tonic-clonic seizures (64,7%) that we observed has also been reported by most of the authors. Several studies show that 9 to 35% of CF are complicated [21]. On the other hand, in Mali, Dembélé et al., Found a predominance of complicated CF, 65,8% versus 34,2 %% for simple CF [9].

As expected, infections of the respiratory tract and the otolaryngologic sphere are the cause of fever in 50,6% of cases. These results are not significantly different from those found in the literature, especially Western, 69,5% [21]. The main causes of upper and lower respiratory infections are herpes viruses and respiratory viruses [22]. The infections of the ENT sphere are said to be frequent in our countries due to climatic variations and especially the growing promiscuity of our cities. Their high frequency should not obscure malaria either, especially in sub-Saharan Africa, where it ranks first among the causes of fever in certain studies [8]. In our study, malaria represented 18,8% of the causes after ortho-rhino-laryngologic infections. Most often seizures stop spontaneously. The most common anticonvulsant used to interrupt seizure in patients with a seizure still on arrival has been diazepam. This practice is consistent

with African literature [8, 9]. In contrast, only 11 patients received preventive treatment for recurrent seizures with phenobarbital. This is explained by the absence of a harmonized protocol in the pediatric emergency care services, but also by the recurrent breaks in phenobarbital at the national level. Paracetamol was prescribed as a discontinuous preventive treatment in 53 patients. In the literature, its effectiveness has not been properly evaluated but it remains important for lowering fever [23].

CONCLUSION

Febrile convulsions are a frequent reason for consultation and hospitalization among children under 5 in the pediatric department of the Ziguinchor peace hospital. The aetiologies are dominated by otorhinolaryngological infections, malaria and bronchopulmonary infections. Improving the prevention and management of malaria and respiratory, otolaryngological and bronchopulmonary infections will help reduce febrile seizures in our context.

ETHICAL APPROVAL

This study was carried out in accordance with the Declaration of Helsinki. To respect confidentiality, the hospitalization number of the file was used for each patient. This study was a hospital-based research conducted under routine conditions.

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