Epidemiological, Clinical and Evolutionary Profile of Child's Cerebral Palsy at Treichville Teaching Hospital: 84 Case Reports

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ABSTRACT

Introduction: Cerebral palsy remains a real public health problem. The objective of this work was to describe the epidemiological, clinical and evolutionary profile of this condition in order to contribute to a better understanding.

Patients and Methods: This is a four-year descriptive retrospective study, from January 2014 to December 2017, of patients followed in general pediatric consultation at Treichville Teaching Hospital. It involved 84 children aged 4 months to 13 years with cerebral palsy diagnosed on the basis of anamnestic, clinical arguments associated with brain damage on cranioencephalic imaging.

Results: Cerebral palsy accounted for 4.2%. The average age was 23.09 months and the sex ratio were 1.89. Previous history was dominated by neonatal suffering (71.5%) and perinatal infection (51.2%). The main signs were hemiplegia (42.8%), tetraplegia (19.1%), and pyramidal forms (78.6%). The disorders associated with cerebral palsy were dominated by epilepsy, language disorders. From a nutritional point of view, 26.2% were acutely malnourished. The imaging results were dominated by subcortical cortical (50%) and cortical atrophy (24%). Perinatal causes were the most frequent (69.2%) and maternal infection was the most common etiology (32.4%). Follow-up was regular in 61.9% of children, 38.1% were out of sight.

Conclusion: In our context, in the absence of multidisciplinary follow-up, emphasis should be laid on training medical personnel in obstetrical and perinatal care to better prevent the occurrence of cerebral palsy.

Keywords

Introduction
Cerebral palsy refers to a group of permanent disorders of posture and movement, responsible for activity limitation, due to no-progressive events or disorders occurring in the developing brain of the fetus or infant [1] This is a real public health problem due to its economic and especially socio-cultural medical consequences [2]. In developing countries, the situation of cerebral palsy is not clearly documented, making it difficult to prevent and manage this condition. The objective of this work was to contribute to a better knowledge of the epidemiological, clinical and evolutionary profile of this condition.

Methodology
This was a four-year retrospective descriptive study conducted in the medical pediatric consultation unit of the Teaching Hospital (TH) of Treichville between January 1, 2014 and December 31, 2017. The population under study consisted of children aged 4 months to 15 years with cerebral palsy followed during the study period. The inclusion was made on the basis of parental consent. The exploitation of the files made it possible to collect socio-demographic data, perinatal history, pregnancy course, state at birth, (after exploitation of the healthrecord), associated pathologies, paraclinical explorations, in particular neuroradiological (CT,

MRI) electrical (EEG) and evolutionary data. Cerebral palsy has been selected on the basis of psychomotor developmental disorders observed before the age of 24 months.

On operable record, newborns, unreviewed children and patients who did not meet the criteria were excluded. The analysis of the data using a pre-established form was processed and analysed using the Epi info software version: 3.5.4.

Results

During the period of the study, 2014 children were seen in general pediatric consultations, including 84 diagnosed with cerebral palsy. This represents a frequency of 04.2%. The average age of the children included in the study was 23.09 months (extremes 48 and 156 months); 54.8% of the children were between 12 and 36 months old. (Figure 1).
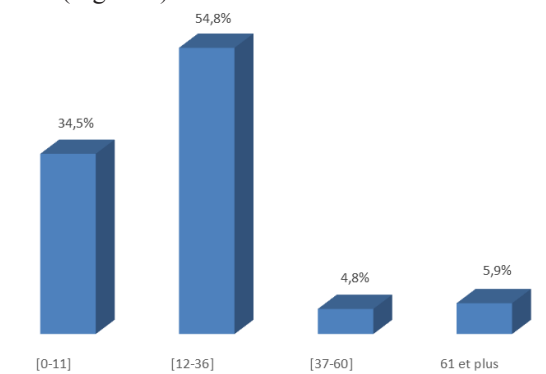

Figure 1: Age distribution in months.

The predominance was male with 55 boys or a sex ratio of 1.89. The average birth weight recorded in 74 children was 2980g (extremes 2000 to 4500g). The majority (70.2%) came from urban areas, while 10.7% came from rural areas and 19.1% from peri-urban Abidjan. The average maternal age at delivery was 28.04 years (extreme 16 and 42 years); pregnancy was correctly monitored in 58 patients (72.5%) and hospital delivery in 81 patients (96.4%). Risk factors were dominated by anoxo-ishemic suffering (71.5%), post-natal central nervous system infections (51.2%). Clinically; pyramidal forms were the most common with 78.6% of cases (66/84). These were hemiplegia (42.8%), i.e. 36 cases, tetraplegia (19.1%), 16 cases and diplegia (16.7%), i.e. 14 cases. The other forms, in particular cerebellar, extrapyramidal and mixed forms, were found in 10 cases (11.9%), 5 cases (5.9%) and 3 cases (3.6%) respectively (Table 1).

Clinical forms	Numbers	Percent (%)
Spastic hemiplegia	36	42,8
Spastic tetraplegia	16	19,1
Spastic diplegia	14	16,7
Ataxia	10	11,9
Choreoathetosis	5	5,9
Undetermined form	3	3,6
Total	84	100

Table 1: Distribution by disorders associated with cerebral palsy.

Disorders associated with cerebral palsy were dominated by epilepsy (70.2%), language disorders (48.8%), and swallowing disorders (46.4%) (Table 2).

Associated disorders	Number	Percent (%)
Epilepsy	59	70
Langage impairment	41	48,8
Swallowing disorder	39	46,4
Strabismus and blindness	34	40,5
Oral and facial dyspraxia	22	22,6
Gastroesophageal reflux disease	9	10,7
Deafness/hypoacusis	8	9,5

Table 2: Distribution by disorders associated with cerebral palsy.

Acute malnutrition was found in 26.2%. Cerebral CT was performed in 61 children, anomalies were found in 50 children (82%) (Table 3). The main lesions were subcortical cortical atrophy (50%) (Figure 2) followed by cortical atrophy (24%) (Table 3).
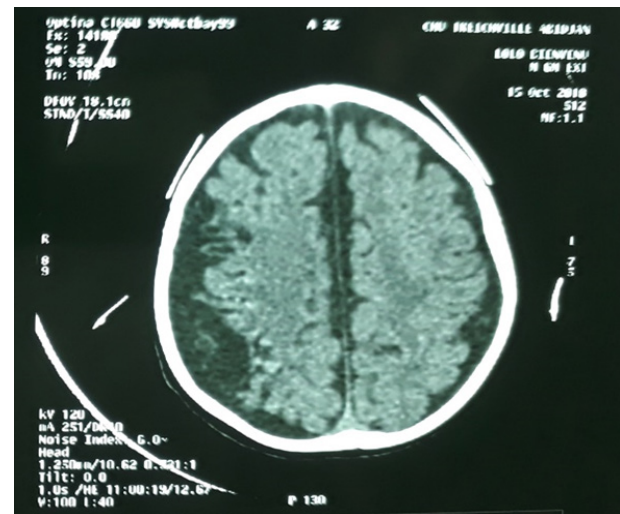

Figure 2: Frontal parietal porencephalic cavity right with bilateral frontal atrophy.

Imaging anomalies	Number	Percent (%)
Cortical atrophy	12	24
Subcortical cortical atrophy	25	50
Porencephaly	3	6
Brain calcifications	3	6
Malformations: Dandy Walker	2	4
Periventricular Leucomalacia	3	6
Other	2	4

Table 3: Distribution according to the anomalies found on the scanner.

Etiologies were found in 68 children (80.9%). The etiologies were antenatal, perinatal and postnatal in 2.9%, 69.2% and 27.9% respectively. Maternal fetal infection was the majority perinatal etiology (32.4%) and intracranial infection (meningitis, cerebral malaria), the majority postnatal etiology (17.6%) (Table 4). Follow-up was effective in 52 children (every 3 months) within an

average of 18 months (extreme 12 and 24 months) and focused on neurological signs and associated disorders. The improvement was considered satisfactory in 22.6% of cases, stagnant in 36.9% and deteriorating in 2.4% of cases; 32 children were lost to follow-up because they were not reviewed after two years.

Etiologies found		Number	%
Antenatal etiologies	Brain malformations	2	2,9
Perinatal etiologies	Maternal and foetal infections	22	32,4
	Prematurity	10	14,7
	Neonatal jaundice	8	11,8
	Severe neonatal asphyxia such as meningitis	7	10,3
Post-natal etiologies	Intracranial infections	12	17,6
	Traumatism	7	10,3

Table 4: Distribution by etiology found.

Comments

The frequency of cerebral palsy in our series was close to that of Taib El Amrani, which reports 6% of general pediatric pathology [3]. Our figures are much lower than those of Mbonda et al. [4] who found a frequency of 20.39% of pediatric pathology at the Yaoundé Gyneco-Obstetric and Pediatric Hospital (HGOPY) in 2011; Nottidge et al. [5] in Nigeria found 16.2% when Doumbia and Nguefack reported 38.5% and 18.35% of pediatric pathology [6,7] respectively. The relatively high frequency among Nguefack and Mbonda is explained by the fact that HGOPY is a usual reference center for children suffering from cerebral palsy in hospitals in Yaoundé as well as in other regions of Cameroon; in Doumbia, its recruitment concerned only children with neurological pathology.

Like Taib El Amrani in Morocco, our children were recruit in general pediatric consultations (newborns are excluded). The average age of the children was 23.09 months; results can be superimposed on those of Ndiaye, who reported an average age of 24 months [8]. In African literature the average age is 28.4 months to 33.3 months [2,4,7,6,9]. Our population was relatively younger. In addition, 94% of the children in our series were under the age of 5. Moifo et al. [10] found 77.4% of children under 5 years of age, Doumbia 80.9%, and Nguefack 85.1% [6,7] while Mbonda et al. [4] found 67.5% of patients over 1 year of age. This corresponds to the age at which the child acquires effective voluntary motor skills and therefore the age of parental concern.

On the other hand, it should be noted that older children with cerebral palsy tend to be hidden from society by families out of shame or fear of others' views on disability. This could also highlight the failure of health professionals involved in child follow-up to identify neuro-motor developmental abnormalities. In addition, according to Gandema, in many cases, parents only decide to consult after they have noticed the failure of self-medication and/or traditherapy, anything that contributes to delaying the first medical contact [2].

There was a male predominance (sex-ratio of 1.89). This predominance was also observed by Gandema, Nguefack, Lagunju and Wichers who reported a sex ratio of 1.56, 1.62, 1.7 and 1.4 respectively [2,7,9,11]. These results confirm data in the literature that indicate that the incidence of cerebral palsy is relatively higher in male patients. This is explained by genetic, hormonal factors and by a neurobiological difference between neurons of both sexes, particularly with regard to their responses to brain damage [12]. In our study, the most likely etiologies of cerebral palsy found are mainly maternal fetal infection and intracranial infections such as meningitis and cerebral malaria. Many authors criminalize perinatal causes as the predominant etiology of cerebral palsy [3-6,13,14]. Our series recorded a low rate of extrem premature babies and anoxo-ischemic suffering due to the high number of hospital deliveries and pregnancies correctly monitored. As for birth weight, no low birth weight (weight $\leq$ 2000g) was recorded. Clinical manifestations of cerebral palsy become apparent to parents around the age of 6 to 9 months Krigger [15]. Axial hypotonia, limb hypertonia, delay in various motor acquisitions such as head holding, sitting, and walking are the main reasons for consultation reported in the literature. In our study, the diagnosis of cerebral palsy was essentially clinical; this approach allowed Tosun A. to classify them into 5 main groups according to topography and motor deficit: monoplegia, diplegia, hemiplegia, triplegia, tetraplegia [16]. In our series, hemiplegia was the most common, as in Taib El Armani, Doumbia and Nguefack [2,5,6], while (expression of prematurity and low birth weight) predominated in Gandema [2]. Our study noted a predominance of spastic forms (expression of the attack of the pyramidal system), also found by many authors [3,4,6,7,17].

Tetraparesis is the most severe clinical form, giving massive damage to the entire body with several associated signs. The predominance of spastic tetraparesis and spastic hemiplegia could be explained by the fact that neonatal asphyxia, which is the first etiology of cerebral palsy found in the African context, is the primary source of spastic forms [18]. The discovery of abnormal movements is not exceptional. In our series, 5.9% athetosis and 11.9% ataxia. Gandema reports 10.3% ataxia and nearly 15% dyskinesia, and Doumbia 3.7% athetosis, 2.2% ataxia [2.6]. These different gestural abnormalities pose enormous problems in the management of both physical and medication, contributing to the patient's increased functional prognosis. The region of the brain affected in cerebral palsy is not perfectly circumscribed and is rarely involved only in motor function; thus, lesions in other developmental spheres are frequent [19]. In our study, the main disorders associated with cerebral palsy were epilepsy (70.2%), language disorders (48.8%) and swallowing disorders (46.4%). In Doumbia, epilepsy was noted in 61% of children. These rates were higher than those of Nguefack, 57.7%, Mbonda 41.5% and Taib El Amrani 40%. The diagnosis of epileptic seizures in cerebral palsy is difficult due to the non-motorized, non-epileptic manifestations associated with this condition. The use of the EEG is important, but in our context, the difficulty of access to this examination makes it of limited interest [4].

Regarding language disorders, our results are lower than those

of Nguefack 63.4 % [7] and similar to those of Mbonda, who found 48.8% of cases (4); moreover, Nguefack found 55.2% of cases of swallowing disorders, a slightly higher rate than ours [7]. Gastroesophageal reflux disease (GERD) was only 10.7%. Gandema yields 10% and Taib El Amrani yields 27%. Its severity is due to its consequences such as peptic esophagitis and malnutrition, which represented 92% in Campunozzi [20], while we report 26.2%.

Identification of imaging abnormalities is common in cerebral palsy; in 61 patients who were able to perform a brain scan, abnormalities were found in 50 or 81.20% of patients. This proportion of anomalies is relatively close to Nguefack and Moifo et al., who found a pathological brain scan in 90.5% and 90% of cases respectively [6,10]. The main scan anomalies found were cortical and subcortical cortical atrophies in 24% and 50% of cases, lesions, cerebral calcifications in 6%, and malformative lesions in 6% of cases. Our results are superimposed on those of the study by Moifo et al., in which cortical-subcortical atrophy predominated (49.1%), and brain calcifications in 10.2% of children. In Nguefack, the main anomalies were cortical and subcortical atrophy in 55.8% and 36.5% respectively, followed by malformative lesions in 6.7% of cases. On the other hand, in Ndiaye, subcortical cortical atrophy and cortical atrophy represented 9% and 3.8% respectively. It should be noted that this author's rate of scanner production is low (only 15.9%). MRI was very rarely practiced; only 4.8% in our series compared to 23% in Taib El Amrani. In contrast to the European series where MRI is the most widely used radiological examination; the rate of realization was 85% in Bonnechère et al. [21]. In our context, access to brain imaging, mainly MRI, is limited by the low socio-economic level of families of children followed for cerebral palsy; this observation was the same for Taib El Amrani and Ndiaye [3,8]. The care is long and difficult with huge financial implications. Motor, speech therapy, locopedic or psychomotor rehabilitation structures are rare, limited in capacity or difficult to access, mainly in our underdeveloped countries [8]. Management of cerebral palsy must be early and multidisciplinary and screening for disability in children at risk must be done through systematic surveillance during the first years of life [1]. Unfortunately, in our study, we were unable to get an idea of the care and development of all our patients due to the lack of structure of our hospital center. This was also the case with Taib El Amrani. As for the drug prescription, it was purely symptomatic and the evaluation of progressive modalities was hampered by the polymorphism of the concomitant disorders of cerebral palsy, especially since these patients are seen by several specialties. The majority of parents of children with cerebral palsy experience a difficult and negative social and financial ordeal that affects their mental and psychological state [22]. This could explain the high rate of lost views in our series such as those of Taib El Amrani, Ndiaye and Zelnik [3,8,23]. Nevertheless, only one was able to integrate a specialized center. We found an improvement in the associated symptoms in 36.9% of cases. Taib El Amrani counted 49%. This improvement mainly concerns digestive, respiratory and committal signs. We recorded no deaths unlike Taib El Amrani and Duruflé -Tapin [3,24]. These deaths are believed to be due

to respiratory and cardiovascular complications complicating cerebral palsy [24]. But we cannot say with certainty given the many "lost sight of" and that our recruitment was almost carried out in consultation.

Conclusion
Cerebral palsy is a public health problem and its causes in our context remain essentially perinatal. Improved pre-, per- and postnatal follow-up, training and information for health professionals involved in monitoring child development could reduce the occurrence of new cases.

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