WILEY'S International Journal of Pediatrics and Neonatal Health

Research Article ISSN 2572-4355

Ischemic Stroke of The Child: Clinical and Evolutionary Aspects at the Teaching Hospital of Treichville (Abidjan)

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Abstract

Objective: The objective of this work was to describe the epidemiological, clinical and evolutionary aspects of ischemic stroke (DALY) in children.Patients and Methods: This is a-year descriptive retrospective study (January 1,2013 to December 31, 2017) at the paediatric emergency unit of the paediatric department of the Teaching Hospital of Treichville were included the children of under 15 years admitted for ischemic stroke.

Results: A total of 14 cases of DALYs included (eight boys and six girls). The average age was 6.2 years with extremes 2 to 14 years old. The mode of onset was brutal in 71.4% of cases and revealing hemiplegia in 100%.cases.Associated signs were disturbances of consciousness (35.7%,), aphasia (28.6%), convulsive condition (71.4%).Brain imaging in this case CT and / or MRI made it possible to make the positive and topographical diagnosis in all our patients and reveal an attack of the average cerebral artery in 64% of the cases.The underlying pathology was dominated by sickle cell disease and heart disease. The evolution was marked by seven complete recoveries, two disabling sequelae, one death and four were lost of view.

Conclusion: DALY is a rare pathology in paediatrics and the etiology dominated by sickle cell disease, so it should be thought before any sign of neurological call and ask for investigations, even if the recovery seems fast

Keywords: Ischemic stroke, Child, Sickle cell disease, Abidjan, RCI

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Citation: Enoh Jacob E et al. (2019), Ischemic Stroke of The Child: Clinical and Evolutionary Aspects at the Teaching Hospital of Treichville (Abidjan). Int J Ped & Neo Heal.3:3, 40-44

Received: July 15, 2019
Accepted: July 23, 2019
Published: August 30, 2019

Introduction

Ischemic strokes are among the most common neurological conditions in adults in which the severity is well established, well-identified risk and prognostic factors [1]

In children, it is a pathology that is poorly documented in the light of numerous diagnoses encountered in emergencies [2,3].

Because of their rarity, they are poorly known by clinicians and the diagnosis delayed [4] Few studies have focused on the study of DALY in children, particularly in Côte d'Ivoire [2, 3-5].

The authors propose to describe the epidemiological, diagnostic and evolutionay aspects of the DALYs of the child at the Teaching Hospital of Treichville.

Patients and Methods

It was a retrospective study with a descriptive and analytical purpose. It took place over a 5-year period (from January 2013 to December 2017). It's setting was the Paediatric Emergency Unit at the Teaching Hospital of Treichville. The survey included any child aged one month to 15 years admitted to the paediatric emergency unit, who showed signs of neurological calls and performed a neuroradiological examination including CT and / or cranio-encephalic MRI.

The following variables were studied: Age, gender, origin, pathological history (sickle cell disease, heart disease ...) Signs of neurological calls: Consciousness disorder ranging from simple confusion to coma, convulsions, signs of location and how they are installed. Associated

signs: hyperthermia, aphasia, disorders of consciousness. Paraclinical examinations: Fundi Oculi (FO), CSF, CBC, Blood Smear (GE), hemoglobin electrophoresis, Echocardiac, brain imaging. The evolutionary modalities after a period of six months.

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 this period we recorded 14390 patients including 14 cases of DALY, an incidence of 2.4.cas / year and a frequency of 0.1%. The average age was 6.2 years with extremes of 2 and 14 years (Table I), eight boys and six girls, a sex ratio of 1.3. Seven patients came from the communes of Abidjan and three from the suburbs, while four came from the interior of the country. A notion of consanguinity was found in six parents and 12 (85.71%) from low socio-economic conditions. The socio-economic level (SEL) was assessed from the analysis of family income, access to water and electricity, the parents' profession and the living environment.

The admission period was 96 hours with extremes of 24 and 144 hours. In terms of history, sickle cell disease was the main history of our children: 10 sickle cell patients (71.4%) including five SS, two AC, one AS and two SSFA2 and four had normal AA hemoglobin (28.6%). One patient (7.1%) had cardiopathy like tetralogy of Fallot. The type of hemoglobin is listed in figure 1. The delay was less than 24 hours in 50% of cases, the mode of onset was brutal in 10 cases or 71.4% of cases and revealing hemiplegia in 100%. It was associated with a disorder of consciousness in 5 cases or 35.7%, fever 6 cases is 42, 9% convulsions 10 cases or 71.4% and aphasia noted in 28.6% patients. (Table II)

At the radiological level, all patients performed a CT scan supplemented with MRI in two patients. The average time to complete these neuro-radiological examinations was four days and involved 10 patients. Four were admitted after the neuroradiological examination; no angioscan was performed. Neuroradiological examinations showed an impairment of the middle cerebral artery (Sylvian artery) in 64% of cases (Figure 2); left cerebral infarction in four cases and right in three cases; an incomplete lesion and an attack. At the etiological level, the underlying pathology was dominated by sickle cell disease in SS form, 35.7% of cases, SSFA2 in 14.3% of cases, AC in 14.3% of cases, and AS 7.1% when cardiopathy was indicative of one case.

All children reveived functional rehabilitation within an average of 4.3 days with extreme two to 10 days. The average duration of hospitalization was 10.8 days with extremes between zero and 40 days (Table III). Other therapeutic measures were used depending on the particular case, the use of Acetyl Salicylic Acid (AAS), the cerbral oxygenators, hyperhydration in sickle cell patients, only one of whom benefited from a transfusion exchange in clinical hematology. After a decline of at least six months, we recorded seven children with satisfactory recovery, two unsatisfactory recoveries with disabling sequelae including the one who benefited from the transfusion exchange and four lost to follow-up. One death was deplored, the one with the cardiopathy type tetralogy of Fallot (Table IV).

Age	Total	Precentage(%)
≤ 24	1	7.1
25-60	7	50,0
61-120	4	28,6
>120	2	14,3
Total	14	100

Table I: Age distribution

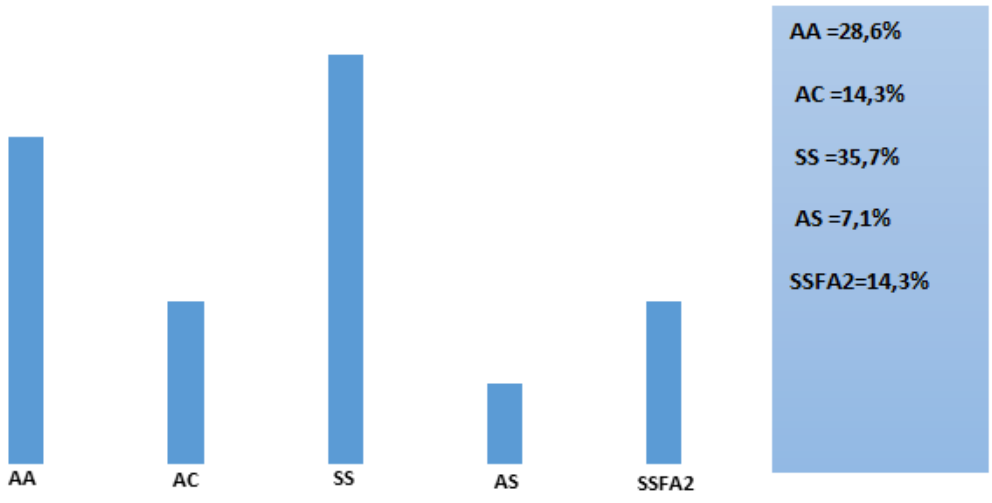

Fig 1 : Type of hemoglobin

		Number	Percentage (%)
Start mode	- Brutal	10	71,4
	- Progressive	4	28,6
Motor deficiency	Right hemiplegia	8	57,1
	Left hemiplegia	6	42,9
	- Disorder of consiousness	5	35,7
	- Convulsion	10	71,4
	- Hyperthermia	6	42,9
	- Aphasia	4	28,6
	- Headahe	9	64,3

Table II: Distribution by clinical signs at admission

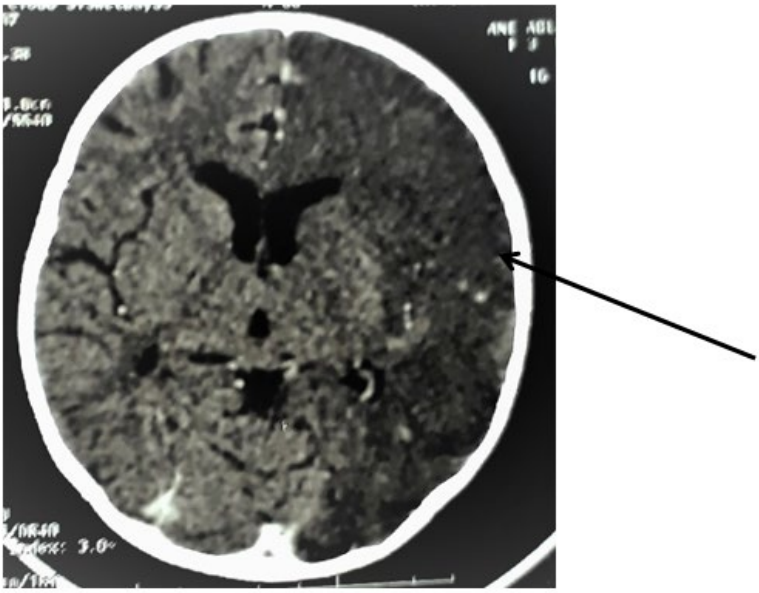

Fig 2: Fronto-temporo-parietal hypodensity left in relation to ischemia of the territory of the left middle cerebral artery.

Duration of hospitalization(Days)	Total	Percentage (%)
0-7	7	50,0
8-15	4	28,6
16-30	2	14,3
>30	1*	7,1
Total	14	100

Table III: Distribution by duration of hospitalization

Evolution	Total	Percentage (%)
Satisfactory recovery	7	50,0
Permanent impairment	2	14,3
Lost of view	4	28,6
Death *	1	7,1
Total	14	100

* cardiopathy type Tetralogy of Fallot

Table IV: Clinical evolution of patients

Discussion

The retrospective nature of our study explains the limits that must be noted from the outset, namely the duration of the study, the data from the clinical and paraclinical examinations. Nevertheless the reported cases draw their originality in two facts:

The rarity of this pathology with regard to the most common disorders of the nervous system such as cerebral malaria, meningitis and meningoencephalitis or other inflammatory disorders of the Central Nervous System. On the other hand, the circumstance of discoveries in the form of a hemiplegia frequently associated with hyperthermia and seizures [6]. The epidemiology, semiology, and etiology of child's strokes are different from that of adults [1], and there are few studies of DALYs children in particular in black Africa [5]. DALYs are related to an arterial occlusion related to a thrombotic or embolic process. This is a rare condition in children. The incidence is estimated at 1.2 cases / 100,000 per year in an American series [2] and between 1.2 and 2.7 cases / 100,000 per year in Asia [7], when Mancini reported 35 cases in 10 years to Marseille [8]. Only the Dijon study has found higher rates [6]. In Africa the interest for this affection is after 2010,s with Bernoussi, Bennani, Ouchen [3, 9, 10] and Ndiaye in a multicentre study in Dakar [5]. The average age in our series is 6.2 years with extremes between 2 and 15 years, Ndiaye in 2015 in Senegal and Ouchen in 2015 in Morocco found respectively an average age of 6.91 and 6.8 years [5, 10] when Bernoussi found 5.8 years [3]. All ages can be affected. As for gender, the predominance of male was noted in Bernoussi, Ndiaye, and Ouchen [3,5, 10]. Our study reports a male predominance; that is to say that in the child, the sex depends more on the underlying pathology. The telling signs are classically motor deficits in this case hemiplegia, seizures and coma.But acute hemiplegia is the most common mode of revealing DALYs in children [5,6,10, 11-13]; it is brutal in 67% Benanni [9] 84.3% Ndiaye [5] and progressive in 50% Bernoussi [3], 58% Ouchen [10]. It is rather flaccid, monologic predominantly brachial: the upper limb [1,4]. This could be explained by the impairment of the average cerebral artery resulting in damage to the brain beam. The average consultation time for the child was 96 hours. In France, Perez found an average delay of 24 hours. This could be explained by the lack of knowledge of pathology among our practitioners; in our context, the first contact is most often the paramedical staff as recommended by the sanitary pyramid of our countries and also some come from the interior of the country .This is why, the observation of these revealing signs must motivate the realization of a neuro-radiological exploration to establish the diagnosis. [12]. The most frequent associated signs were hyperthermia, the alteration of consciousness also found in Ndiaye and Bennani [5, 9], when aphasia prevailed in Bernoussi [3]. Diagnostic confirmation was possible in all our patients by performing a CT or MRI after an average of 4.3 days related to the difficulties of parents from modest socio-economic conditions. By default health insurance, these exams should be funded. Cerebral ischemia in the middle cerebral artery was reported in 64% of cases. Ndiaye in Senegal reports 79.7% and Ouchen in Morocco and [5.10]. At the etiological level, while in adults, arterial hypertension and arteriosclerosis are the most frequently identified risk factors in men adult, Castelnau [1], children have a much richer range concerning DALY. [1, 14, 15].We find the hemoglobinopathies (in this case sickle cell disease), congenital heart disease, infections of the Central Nervous System as reported by many authors [3, 10, 16] .The etiologies of paediatric DALYs are dominated in Africa by sickle cell disease, of which vaso-occlusion of the cerebral arteries is a complication, realizing a more or less old cerebral infarction, without omitting the infectious etiologies such as angiitis due to meningitis [1, 5]. In all cases, it would be necessary to think about it and ask a neuro radiological exploration for diagnostic confirmation [1,12] or the practice of serial investigations [1,12, 14] especially when Moya-moya disease is suspected [11]. MRI is the best examination for the analysis of intracranial lesions, as it provides complementary topographic data to the positive diagnosis and allows a widespread etiological investigation; but it is a costly examination often beyond the reach of our low-income populations; this observation is also made by Ndiaye [5]. Our two patients who performed an MRI were treated by an None Gouvernemental Organization NGO. The prognosis of DALYs in children varies according to the age, the cause and the delay in the management of functional rehabilitation, [13]. We reported one death in a patient with cyanogenic heart disease like tetralogy of Fallot.This factor of bad prognosis is reported in the literature [5, 9, 13,17]. The lost in view in our context could be explained by the residence (out of Abidjan) and also the modest social conditions. Our rate is close to that of Bennani, (37%) [9]. The complete recovery was possible because of the diagnosis before 48 hours and especially the practice of physiotherapy but also older children. This same observation was made by Perez, Chaou [13,18] as well as the rate of disabling sequelae in the youngest children hindering daily life [5,18]. This was the case of a five-year old, an SS sickle cell patient with transfusion exchange and a six-year old girl, SSFA2 sickle cell patient with recurrent DALY. In the literature, recurrence of DALY is reported in some children [4, 9,17].

Conclusion

Paediatric DALYs is serious,but underestimate in our context. Due to their relative rarity, they are poorly known by the clinician and the diagnosis delayed. Threrefore, we should think about it before any sign

of neurological call and ask for investigations and even if recovery seems fast. In Africa, the main cause is related to sickle cell disease, the diagnosis of which should be early. However, and prospective and multicenter study is needed in our country to know the real impact.

Disclosure of interest : The authors declare that they have no competing interest

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