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Research Article

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Therapeutic and Evolutionary Aspects of Non-Traumatic Comas in Central African Children

Olivier Brice Bogning Mejiozem[1*], Moyen Engoba[2], Evodie Pierrette Bogning Kakounguere[1], and Jean Chrysostome Gody[1]

[1]*Centre Hospitalier Universitaire Pédiatrique de Bangui, (République Centrafricaine)*

[2]*Université Marien Ngouabi, Brazzaville, (République du Congo)*

[*]Corresponding Author
Olivier Brice Bogning Mejiozem, Centre Hospitalier Universitaire Pédiatrique de Bangui, (République Centrafricaine).

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Abstract

Introduction

Non-traumatic coma is the most common pediatric medical emergency. Their therapeutic and evolutionary profile remains controversial in resource-limited countries. We report our experience with 370 children.

Objective

To evaluate the management and evolution of nontraumatic comas in the intensive care unit of the Pediatric Hospital Complex of Bangui (CHUPB). Materials and methods: This was a descriptive and analytical cross-sectional study conducted between January 1 and June 31, 2021 at the CHUPB. Children aged 1 month to 15 years, admitted to the intensive care unit of CHUPB with a Glasgow score less than or equal to 8 in a trauma-free setting were included. Data were entered and analyzed using SPSS 20.0 statistical software. The statistical test used was Pearson's chi-square. Any p-value <0.05 was considered statistically significant.

Result

During the study period, 370 children were admitted to the intensive care unit of CHUPB for non-traumatic coma. The sex ratio was 1.35 and the mean age was 35.95±27.21 months. Neuromalaria (29.72%), meningitis-meningoencephalitis-encephalitis (30%), septic states (19.72%) and acidotic coma (5.40%) were the main etiologies. The children had received emergency drug treatment based on anticonvulsants in 59.18% of cases, antipyretics in 91.35% of cases and dopamine 18.1% of cases. Drug treatment was adapted to the etiology in 44.60% of cases and probabilistic in 55.40% (n=205) of cases. Neurological sequelae were noted in 8.93% of cases and death in 36.48%, 57.77% of which occurred within the first 48 hours.

Conclusion

Infectious diseases are the predominant cause of biologically documented non-traumatic comas and are also the cause of non-documented clinical situations. This reality has induced the use of anti-infectives beyond the rational with an outcome marked by high mortality and sequelae. The transformation of these outcomes requires the reinforcement of the technical platform of the CHUPB.

Key Words: Non-Traumatic Coma, Child, Therapeutic, Evolutionary and Chupb.

Introduction

Coma is a frequent reason for consultation and admission to pediatric emergency departments [1]. There are two types of coma: traumatic and non-traumatic. Non-traumatic comas, the most frequent, are dominated in Africa by infectious pathology. These include malaria and neuromeningeal infections, especially infectious meningitis [2-10]. The incidence of non-traumatic comas in children worldwide is 30 per 100,000 children [11-12]. This incidence varies according to the continent. It varies from 5.4% to 16.3% in Africa [1, 4, and 6] and from 1.67% to 2 in the Middle East [13, 14]. This incidence is 4.32% in CAR [15]. The related mortality is 8.2% in the West [16], it varies from 16.66% to 40% in Asia [13, 14, 17-19] and from 26.7% to 50% in Africa [1, 2, 4, 5, 9, 20-22]. The high mortality in Africa is attributable, among other things, to

the depth of the coma, late admission due to the delay in consultation, the predominance of children under 24 months of age, and the quality of management, sometimes due to the obsolescence of the technical facilities of emergency departments and intensive care units [1]. In addition to the risk of death, children are also likely to have neurological sequelae [23, 24]. The problems posed by this condition are difficult and require a good understanding of the semiology and a real diagnostic and therapeutic strategy for their solution [25]. In order to improve the management of children hospitalized at the CHUPB for non-traumatic coma, this study aimed to determine the therapeutic and evolutionary profiles.

Methodology

This single-center cross-sectional study was conducted over a six-month period from January 1 to June 30, 2021, in the intensive care unit of the University Hospital of Bangui (CHUPB), the only referral hospital and the only facility specialized in the care of children with life-threatening distress in CAR. The center receives children between the ages of zero and 15 years, either from home or referred from a public or private health center in the capital and the provinces. Guaranteed care before and during the study period was supported by government and development partner funding. After informed consent from parents or guardians, children aged 1 month to 15 years, admitted to the intensive care unit of the CHUPB with a Glasgow score less than or equal to 8 in a trauma-free setting, were included in the study. Children with traumatic coma, those admitted for non-traumatic coma with a GCS score greater than 9 on entry examination, and those who were sedated on admission before the GCS score was recorded were not included. Data collection began by obtaining research authorization from the deanship of the Faculty of Health Sciences of Bangui (CAR); before approval by the head of the intensive care unit of the CHUPB. For each file studied, the purpose of the study was presented to the parents or legal guardians before accessing the intensive care hospitalization rooms and the hospitalization records. Confidentiality was also maintained. Thus, for each child, the data were collected from a pre-established survey form and the data entry was done through the SPSS 20.0 statistical software. For word processing we used Microsoft Word 2003. The results, presented in the form of tables and graphs, were done in Excel version 2003. The statistical test used was Pearson's chi² and any p-value <0.05 was considered statistically significant. The Odds ratio was calculated with a 95% confidence interval. There were no conflicts of interest.

Results

General Data of the Children

During the study period, 370 children were hospitalized in the intensive care unit of CHUPB for nontraumatic coma, of whom 57.5% (n = 213) were male and 42.44% (n = 157) were female; a sex ratio of 1.35. Their ages ranged from 1 month to 14.8 years with a median of 2.58 years. The predominance of children under 5 years of age was 88.03% (n = 322) compared to those over 5 years of age who represented 12.97% (n = 48). Clinical and paraclinical investigations had confirmed an etiology in 44.60% (n = 165) of cases. In 55.40% (n=205) of cases, the diagnosis was not confirmed until the child was discharged or died.

The main diagnoses were neuromalaria in 66.66% (n=110) of cases, acidotic coma in 12.12% (n=20) of children, bacterial meningitis in 6.66% (n=11) of cases, hypovolemic shock in 5.45% (n=9) of cases status epilepticus in 3.11% (n=5) of cases, multifocal tuberculosis in 2.4% (n=4) of cases, uremic encephalopathy in 1.8% (n=3) of cases, and hypoglycemia related to severe wasting in 1.8% (n=3) of cases.

Diagnostic suspicions (55.40%) were divided into sepsis in 19.51% (n=40), septic shock in 16.09% (n=33), meningitis in 15.60% (n=32), meningoencephalitis in 15.12% (n=31), encephalitis in 15.12% (n=31), post-phytotherapy poisoning in 6, 82% (n=14), neuro-meningeal tuberculosis in 6.82% (n=14), hemolytic uremic syndrome in 1.48% (n=3), brain abscess in 1.48% (n=3), sickle cell stroke in 0.98% (n=2), and an intracranial expansive process in 0.98% (n=2) of cases.

Therapeutic Data

Emergency Procedures Performed on Arrival

Before transfer from the medical emergency room to the intensive care unit of the CHUPB, a good-caliber venous line was placed in 99.18% (n=367) of children and an intraosseous line in 0.82% (n=3) of cases. A Guedel's cannula was inserted in 66.5% (n=245) of cases, pharyngeal suctioning was performed in 37.83% (n=140) of children, oxygen therapy was administered in 46.48% (n=172), correction of hypoglycemia was performed in 29.18% (n=112) of children, vascular filling was performed in 18.64% (n=69) of cases, and an emergency transfusion was performed in 15.94% (n=59) of children.

Complementary Actions in Intensive Care

Complementary intensive care procedures were the placement of a nasogastric tube in 99.18% (n=367) of children and a urinary catheter in 87.56% (n=324). Fluid administration was based on need in 97.02% (n=359) with fluid restriction in 29.45% (n=109). Nursing was performed in all children (100%).

Drug Treatment

The treatment of the children was based on clinical orientation and etiological research. Regarding etiological treatment, 44.60% (n=165) of children received treatment adapted to the etiology and 55.40% (n=205) received probabilistic treatment.

The drug treatments administered are recorded in [Figure 1].

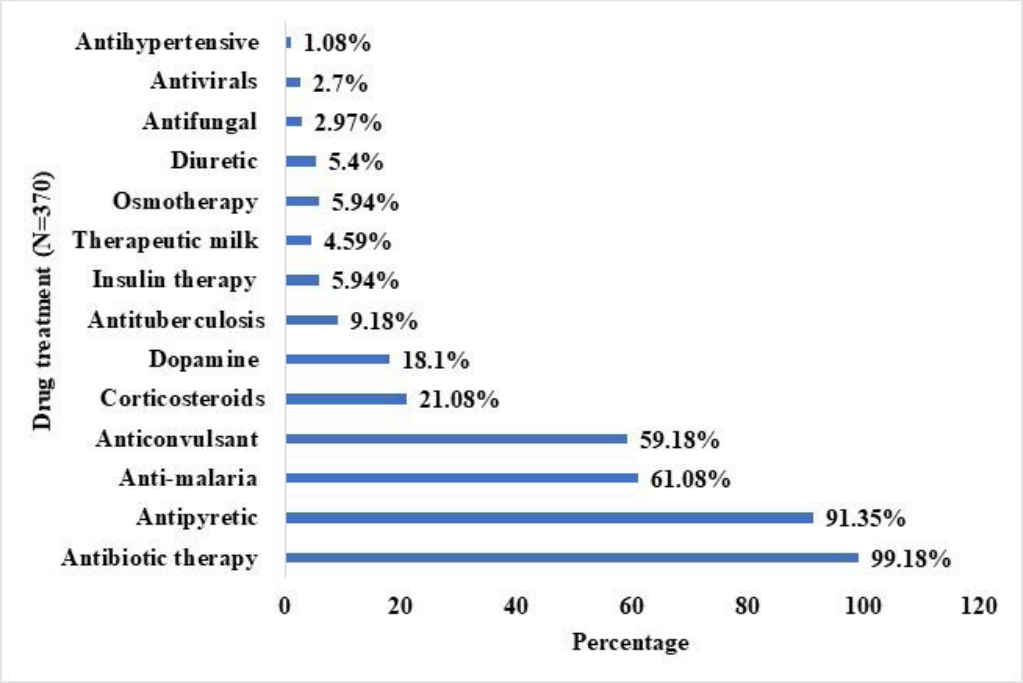

Figure 1: Distribution of children by drug treatment.

Évolution

The mean duration of hospitalization was 158.16 hours with extremes of 2.8 and 696.4 hours. It was less than 24 hours in 22.16% (n=82) of cases, between 24-72 hours in 22.72% (n=84) of cases, between 72-168 hours in 27.29% (n=101) and more than 168 hours in 27.83% (n=103). The evolution was favorable in 57.83% (n=214) of cases. Complications were reported in 42.16% (n=156) of cases, with 8.93% (n=21) of neurological sequelae and 36.48% (n=135) of deaths. The mean time to death was 22.34±2.3 hours with extremes at 1.9 and 523.4 hours, with 57.77% (n= 78) of cases within the first 48 hours and 42.23% (n=57) after the 48th hour.

For the 21 children with neurological sequelae, 9 cases of dysarthria, 4 cases of tetraparesis, 2 cases of paraparesis, 2 cases of peripheral hypertonia, 2 cases of axial hypotonia, 1 case of hypoacusis and 1 case of epilepsy were noted.

The neurological complications are recorded in [Figure 2].

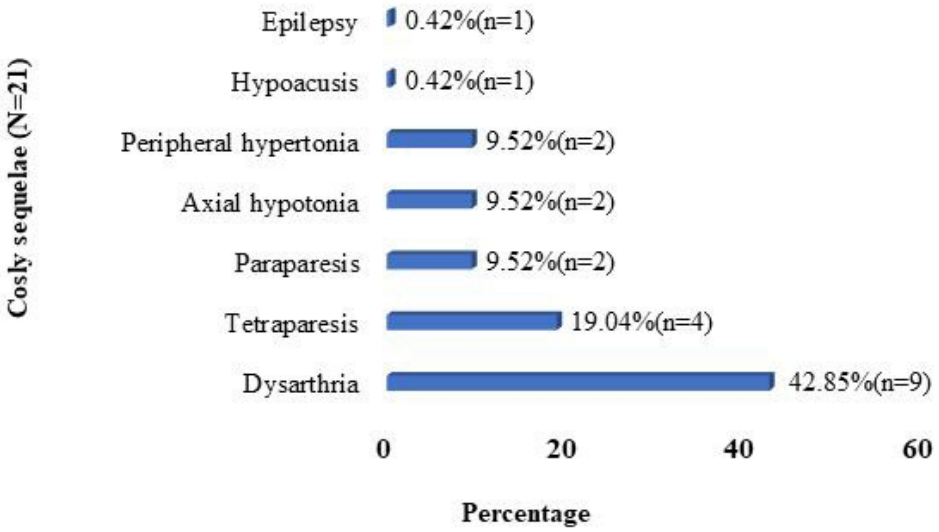

Figure 2: Distribution of children by neurological complications.

Discussion

Non-traumatic comas are a relatively frequent pathological entity whose management and prognosis depend on the etiology, the quality of human resources, the technical facilities of the receiving intensive care unit and the socio-economic level of the countries [26]. Coma remains an evolving condition [27], the severity of which requires monitoring by trained personnel. The management of a comatose child is based on two essential and complementary aspects: on the one hand, to ensure the immediate management of vital complications; and on the other hand, to set up a therapy targeting the cause thanks to the determination of the level and the mechanism of damage to the central nervous system, by means of a meticulous clinical examination and certain biological and neuroradiological tests [25]. These essential aspects, evoked by Sachs [12], led us to discuss the therapeutic attitudes and the evolution of patients both in the emergency department and in the intensive care unit.

Therapeutic Attitude in the Emergency Department of the CHUPB Hospital emergency departments play a vital role in the health care system and are an indicator of the quality of care. It is the place of first resort in case of vital distress [28]. The CHUPB medical emergency department is a structure that operates 7 days a week and 24 hours a day. It has a patient triage system as well as the means to screen for anemia, thermal, respiratory and blood sugar disorders. Management guidelines are also available. The management schemes for a child in vital distress in the CHUPB emergency room are based on mnemonic means, from the American ABCD system ("Airways, Breathing, Circulation, Defibrillation") of the Advanced Cardiac Life Suppor [29], which replaced in 2015, the color system commonly used in French SMURs (blue = ventilation, red = circulation, yellow or white = miscellaneous). The contents of the emergency cart are thus organized according to the needs of each ABC (Airway, Breathing, and Circulation) procedure. These means of screening and procedures reflect the need to have pre-established strategies for the organization of human and material resources in these services [12]. However, the Bangui emergency medical service, the only place of reference, receives emergencies from the whole country and from the neighboring regions of the Democratic Republic of Congo. This observation suggests a mismatch between the supply and use of the service; constituting. The problem of large flows of children; responsible for dysfunctions. The CHUPB emergency department team - consisting of a senior pediatrician, two resident doctors in their third year of specialization in pediatrics, four general practitioners, a nurse manager, and 12 nurses - had to deal with the 370 cases of non-traumatic coma that transited there before being admitted to the intensive care unit. The lack of management of upstream flows from peripheral health facilities and the inadequacy of downstream hospitalization capacity contribute to this situation. In some situations, care is provided without the supervision of the senior pediatrician. This is similar to the inequity of care described by Chabernaud [28].

This inequity is not the exclusive characteristic of the less fortunate countries insofar as a study, carried out in the pediatric emergency department of the CHU of Lyon, revealed that senior management by an emergency physician and a resuscitator was involved in 47% of cases [30]. Far from accepting this discrepancy, which shows that there is room for improvement from one region to another, it should be remembered that the implementation and management of pediatric life-saving emergencies should be based on the specific skills of both medical and paramedical personnel [28]. With this in mind, what were the particularities of the initial management of cases of non-traumatic coma; with regard to the main vital disorders observed on arrival of patients at the CHUPB emergency department?

Prise En Charge Ventilatoire

As in any emergency situation, the first reflexes were to control breathing, the first step in the management of a comatose child. Oxygen therapy was administered to 46.48% of our children preceded by aspiration of oropharyngeal secretions in 37.83% of children. The placement of an oropharyngeal Guedel's cannula concerned 245 children. The purpose of the Guedel's cannula was to help maintain the pharyngeal pathway open by preventing the posterior fall of the tongue and to facilitate oxygen therapy by mask as described in the literature [31-34]. Due to lack of equipment, no recourse to mechanical ventilation was made. The interfaces used to administer oxygen are the nasal cannula, the simple face mask and the Venturi mask. Mapoure in Dakar [35] reported the systematic use of nasal oxygen therapy in adult comatose patients and - comparing the outcome of the patients who benefited from the non-invasive method with that of Zambian patients on mechanical ventilation - underlined the contribution of the invasive method to the survival of Zambian patients. This suggestion should not, however, elude the fact that in non-traumatic comas the decision to intubate is based on the patient's ability to protect his upper airway, the estimated time to recovery and the depth of the coma (Glasgow < 8) [36,37]; considering above all oxygen as a drug [38]. As such, its prescription is subject to specific indications and prescription rules [39]. In this study, the clinical situations that led to oxygen therapy were diabetic ketoacidosis, status epilepticus, uremic encephalopathy, neuromalaria, bacterial meningitis, brain abscess and multifocal tuberculosis. If we stick to this enumeration, the central origin of respiratory distress is preponderant compared to decompensated respiratory pathologies as attested by the data in the literature [40,41].

Hemodynamic Management

After control of respiratory function, hemodynamic management is the second step in case management. Therapeutic measures in this setting included a good-caliber peripheral venous line in 99.18% of children and intraosseous placement in 0.82% of cases. Hemodynamic instability resulted from septic shock and hypovolemia in 16.09% and 5.45% of cases respectively. To correct early the vasoplegia induced by septic shock, the CHUPB emergency team performed first-line vascular fillings with isotonic saline solutions in 12.12% of the children. For septic shock refractory to the three fillings, a vasopressor (dopamine) was administered with doses varying from 5 to 20ug/kg/min by electric syringe. Dopamine represents our choice in the absence of the catecholamines, recommended by "surviving sepsis campaign", which are norepi-

nephrine (noradrenaline) as the first choice vasopressor, titrated to achieve MAP ≥ 65 mmHg and epinephrine (adrenaline) as a second choice, if MAP goals are not achieved [42,43]. However, it should be noted that Martin et al. showed the clear superiority of norepinephrine over dopamine; even at doses above 20 µg.kg-1. min-1 [44,45]. For De Barker, dopamine acts only partially to restore blood pressure in vasoplegic states [46]. Moreover, it has dose-dependent pharmacological effects [47]. These are pharmacological realities that reveal the limitations of our choice in terms of efficacy and recommend the availability of appropriate vasopressors at CHUPB.

Metabolic Management

Glycemic disorders were the main metabolic abnormalities sought on admission, due to the lack of exhaustive means of metabolic exploration. The initial management concerned hypoglycemia in 29.18% and disorders secondary to uncontrolled or poorly controlled hyperglycemia in 5.94%. The first case involved venous administration of hypertonic glucose solutions and the second involved insulin therapy. The preponderance of the glycemic deficit observed here should lead to the risk of definitive cerebral sequelae in case of recurrent or prolonged attacks, particularly in infants [48]. This is a matter of urgent intervention [48]. Especially since Papadopoulou points out that it would be desirable to overtreat hypoglycemia since glucose infusion in children is safe in case of misdiagnosis [49]. For recurrent/refractory hypoglycemia, the main indicator remains biologically proven liver failure at CHUPB. The problem of etiological diagnosis arises as much from the toxicological as from the microbiological point of view, where the related explorations are lacking in the case of intoxication or are limited in terms of feasibility for microbiology in the case of sepsis. The transition from a situation of hyperglycemia in the first hours of sepsis to hypoglycemia at the stage of irreversible liver failure [50], is to be stigmatized in order not to forget the other causes of the alteration of the hepatic functions, both acquired and congenital. All these problems constitute the challenges of management in the intensive care unit after their transfer from the emergency department.

Therapeutic Attitude in Intensive Care

The second phase of management of comatose children at CHUPB takes place at the intensive care level. The CHUPB Intensive Care Unit dedicated to life-threatening conditions is the unit with the highest intensity of care and a higher level of monitoring and control of vital parameters. It has a capacity of 22 beds in two rooms. The unit is equipped with devices for in situ diagnostics (pulsometer, glucometer and urine dipstick), manual ventilation, oxygen therapy (suction catheters, electric aspirators, oxygen extractors, masks and nasal cannula) and intravenous infusions. Cardiorespiratory monitors and syringe pumps are also available. Central line intakes are not performed. The paramedical staff is composed of 4 state-qualified nurses and 16 health assistants. Four on-call teams, comprising one nurse and four assistants, are set up. Two 12-hour rotations are organized for each room, with a 48-hour rest period for staff who have spent the night. The coordination of paramedical activities is ensured by a nurse manager. The night guards are under the supervision of the resident doctors and the pediatrician on call. During the day, medical interventions are provided by two out of four resident physicians under the supervision of a senior pediatrician. The intensive care team is not coordinated by a resuscitator, although it should normally be in order to systematize and prioritize the management in order to orient the therapeutic approach and avoid iatrogeny [12].

It should be noted that the SARS-Cov2 pandemic did not affect the staff during the study period. The same written care guidelines in the form of a card or therapeutic guideline are available in each of the intensive care rooms. Continuous in situ training is provided in simulation on resuscitation techniques and care practices at CHUPB. In the recommendations of the CHUPB pediatric emergency guide, etiological research must be prioritized according to the frequency linked to the endemicity, severity or reversibility of the pathologies. Thus, research begins in the emergency room to contain vital threats and preserve the chances of reversibility of the pathology. It continues in the intensive care unit to consolidate the benefits acquired on admission while awaiting diagnostic confirmation leading to therapeutic adjustment. This therapeutic adjustment is facilitated for malaria by the availability of the thick drop, the blood smear and the malaria RDT.

Toxicological investigations are lacking and make it difficult to choose an antidote or appropriate interventions in cases where the evidence of intoxication is not apparent. Cytobacteriological examination of urine, CSF culture and PCR, which can be performed in other laboratories at the parents' expense, pose the problem of financial access. For the 76 CSF samples taken, the CHUPB laboratory offered biochemistry, cytology, and direct examination after Gram staining free of charge. The need to perform multiple blood cultures poses the problem of feasibility. These pitfalls during diagnosis necessarily affect the curative intervention of the causes as to their accuracy and precocity. This concerns 55.40% of children whose etiological diagnosis could not be confirmed until discharge or death in this study. This reality is common in middle-income countries [51] and confirms the findings of the "Joanna Briggs" Institute on the high frequency of diagnostic errors in non-traumatic coma in children in countries with limited resources due to the similarity of signs of the different etiologies of coma [51]. In this context where undocumented causes dominate, what are the lessons learned regarding the practical conduct of non-traumatic coma in the intensive care unit of CHUPB?

Diagnostic Approach

The etiologies of nontraumatic comas are mainly attributed to central nervous system infections (82.43%) both in this study and in others [1,2,4,6,11,13,14,17,18,19,52,53,54,55,56,57,58,59]. Elsewhere, the preponderance of infectious etiology in the occurrence of death in children with non-traumatic comas provides evidence of this [6,10,22,52,60]. If not the observation of septic shock which announces the existence of infections [6,22,61].

CareProcedure

This consisted of a rapid verification of the satisfaction of the pa-

tient's needs by the nursing staff in the intensive care unit. This check is a prerequisite after the patient has been installed, since this precaution allows errors - observed in the systematic application of the three-pipe rule in the emergency department - to be corrected by the intensive care unit team, which places the appropriate catheters for the bladder and respiration. This approach, in the event of an intervention deficit (no catheter placement), revealed parental opposition to the procedure on admission because of community perceptions associating catheter placement with impending death. Nevertheless, this gastric tube has the advantage of introducing tube feeding and constitutes, in our working conditions, the safest way to feed comatose children; knowing that parenteral nutrition - not subsidized - remains out of reach for the majority of parents. Faced with this reality, the control of access to hospital wards and the informed choice of adjuvant interventions through explanations provided to accompanying persons should contribute to reducing resistance to their realization. Nursing remains systematic in the management of all comatose children in our department.

Etiological Management

The highlight of this study is attributed to the large number of patients arriving from the emergency department to the intensive care unit with no recognized cause for their clinical situation. The lower medical density could explain this reality which feeds the therapeutic empiricism usually observed in health services in sub-Saharan Africa [62]. Referring to the period of the study - covering the second part of the dry season and the beginning of the rainy season - and to the families of drugs used presented in figure 1, it is worth noting the important place of anti-infectives in the etiological management of non-traumatic coma. The epidemiological profile of the country - with malaria endemic and in the background HIV infection and undernutrition [15] allowing the possible occurrence of sepsis and its consequences - reflects well the therapeutic approach. However, is it justified to prescribe antimalarial drugs in almost all cases? What about the prescription of antibiotics? What about the timing of starting anti-infectives? The high number of deaths in the first 48 hours and the complications raise questions about the relevance of prescriptions for etiological purposes and the time required to start them. In most countries south of the Sahara, antimalarial drugs are routinely prescribed for all children suffering from non-traumatic coma. Antimalarial protocols vary according to the years of study and the evolution of WHO recommendations. These protocols include quinine in the older recommendations and artesunate in the more recent ones [1, 2, 6, 9, 10, 12, 17, 22, 23, 52, 63-66].

Based on this observation, antimalarial treatment in our study is not systematic. In fact, antimalarial treatment was prescribed in 61.08% (n=226) of cases, while neuromalaria was confirmed by a thick blood sample in 29.72% (n=110). Routine prescription of antimalarials was therefore only given to 31.35% (n=116) of children. The discrepancy between the prescription of drugs and the number of confirmed cases may be due to decisions to start treatment after self-medication, induced by the possible existence of "parasitologically decapitated" malaria in the mind of the prescriber; if not simply the fact that, faced with diagnostic difficulties, doctors mentioned malaria as the first line of defence in the case of any non-traumatic febrile coma. This over-prescription of antimalarial drugs has been reported in two African studies [1, 20].

The authors believe that cases of neuromalaria could include cases of viral encephalitis or neuromeningeal hemorrhage based on the fact that healthy children have a positive malaria parasitology [1, 20]. The decisive fact, taking into account these observations in malaria endemic areas, is that a positive thick drop should not exclude the possibility of having other diseases and that the exploitation of the "point of care" dedicated to HIV should be extended to other viruses. Here and there, the inadequacy of the technical platform is at the origin of these difficulties [1, 20]. This possibility of comorbidity leads us to consider, at this stage of the discussion, the prescription of antibiotics in a proportion of 99.18% (n=367) during this study. This statistic is close to the data in the literature reporting probabilistic antibiotic therapy in 81% of cases [68, 69].

In the case of management in the intensive care unit of the CH-UPB, antibiotics were combined with antimalarial drugs in almost all cases, given the respective numbers of children who received these drugs. This association, too frequently observed here, precedes the WHO recommendations [67] with however few documented results of CSF samples. The unjustified coverage of possible bacterial meningitis should fuel this overprescription of antibiotics where from admission, antibiotic therapy is routinely instituted in our children in the absence of bacteriological evidence and/or antibiogram. Comparing the percentage of deaths (36.48%) observed in this study where the limits of the WHO recommendations on the treatment of neuromalaria are exceeded to that (30%) of another sub-Saharan African country using antimalarial drugs and antibiotics according to microbiological evidence, the limits of germ coverage appear with the possible corollaries of the presence of pathogens escaping from the drugs in question because of their resistance or species and the delay in starting the treatment. This observation raises the question of the abusive use of self-medication antibiotics in the Central African Republic and related resistance in pre-hospital settings. The same is true of antimalarial drugs [70]. Probably the delay in treatment makes therapeutic success (antimalarial and/or antibiotic) uncertain and would explain the loss of life in the first 48 hours.

Evolutionary Data About Mortality

According to the literature, the prognosis of non-traumatic coma is particularly severe in African children. Egypt pays a heavy price with 50% of deaths in Fouad's series [5]. The mortality rate of 36.48% (n=135) makes the Central African Republic the second highest African country. Our results are similar to the 36% observed respectively in Congo Brazzaville by Moyen in 2005 [2] and in Nigeria by Bondi in 1991 [3]. Another Nigerian study done in 2011 by Ibekwe found the same rate as in 1991 [4]. On the other hand, other African authors have found lower rates than ours. They are the authors of Benin with 30% in 2020 [20] and Togo, 28% in 2005 [22]. Another Togolese study conducted in 2012 notes a decrease in mortality (27.6%) compared to 2005 [6]. The data from

the Asian continent are close to those from the African continent. An Asian metanalysis found a death rate of 33.9% [55]. The European study conducted in 2021 found a mortality rate of about 8.2%; very low compared to the African and Asian studies [16]. This review shows the lesser progress in survival of children with non-traumatic coma in Africa and Asia compared to the outcomes obtained in Europe. The inequity in management mentioned above is to be blamed on access to quality care. For the CHUPB, the absence of a resuscitator and the partial presence of a senior pediatrician favored the occurrence of deaths through diagnostic errors as well as barriers to early care, the sources of which are found in delays in decision-making on the part of service users. In all cases, socioeconomic level, parental education, young age, and co-morbidities cloud the prognosis, resulting in both death and sequelae.

About the After-Effects

Among the 235 children who survived, 91.07% (n=214) were unharmed and 8.93% (n=21) had neurological sequelae. This rate is lower than those observed in Togo and Benin respectively, of about 28% and 30.76% [6, 20]. Our results are within the range estimated by the WHO; reporting the probability of retaining neurological sequelae between 5% and 30% in children who survive neuromalaria [23, 24]. Regarding the origin of the sequelae in this study, neuromalaria is the first provider of neurological sequelae with 42.85% (n=9) of cases; followed by neuromeningeal tuberculosis and sepsis with 14.28% (n=3) for each pathology.

Conclusion

The present study - starting from the medical density and the patient's course - has made it possible to highlight the types of care offered to children admitted for non-traumatic coma at two key locations of a referral hospital in sub-Saharan Africa, as well as the challenges related to both the diagnosis and the care provided and their adjustment; knowing that, in light of the literature, it is relevant to give a preponderant place to infectious causes during the occurrence of non-traumatic coma in children in the Central African Republic In the light of the evolution of the patients, the following are indexed:

- On the side of the service users: the delay in consultation, the essential witness of which is the recourse to self-medication and ignorance.
- On the hospital side: the absence of a system for regulating the flow of patients, the lack of emergency physicians and resuscitators, the discontinuous supervision of care activities by senior pediatricians, the large number of children whose causes of coma are not documented from a microbiological, metabolic and toxicological point of view, the probabilistic use of anti-infectives and the limits of clinical and paraclinical evaluations in the event of therapeutic failure.

In perspective, vaccination, toxicological and metabolic explorations, rapid detection tests of viruses and bacteria must be popularized to save anti-infectives, the acquisition of competent human resources and the sensitization of communities on the evils of self-prescription of drugs as well as on the negative influence of certain cultures could contribute to the decrease of avoidable infectious diseases, to the medical densification and the implication of the community to improve the survival of the child.

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