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Research Article

Ophthalmological Manifestations of Infectious Embryo -Fetopathies at the Yaoundé Gyneco-Obstetric and Pediatric Hospital-Cameroon

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Abstract

Introduction: The aim of this study was to describe the ophthalmological manifestations observed in children with infectious embryo-fetopathies at the Yaoundé Gyneco-Obstetrics and Pediatrics Hospital (HGOPY).

Methodology: We conducted a descriptive cross-sectional study with retrospective and prospective data collection at the ophthalmology and pediatric unit at HGOPY from January 5, 2017 to December 30, 2021. Patients with embryofetal abnormalities admitted to the pediatric department who parents consented to participate in the study were included. The variables studied were sociodemographic data, medical history, general and ophthalmological clinical characteristics and CT scan findings. These data were supplemented by a thorough ophthalmological examination to describe the current state of ocular disorders.

Results: We included 20 patients (40 eyes). The sex ratio was 1.2. The mean age was 39 months ± 25 months, with a range of 2 months to 109 months (9 years). The most frequently implicated pathogen was cytomegalovirus (25%). Psychomotor developmental delay was the most common neurological disorder (85%), while decreased visual acuity was the most frequent ophthalmological sign (40%). Ophthalmological manifestations were observed in 45% of the study population; the most common were chorioretinitis scars (10% of eyes) and microphthalmia (7.5% of eyes).

Conclusion: Infectious embryo-fetal diseases are a public health problem in our context. Their ocular repercussions are frequent and sometimes irreversible in children.

Keywords: Embryo-Fetal Infectious Disease; Ophthalmological Manifestations; Children; Yaoundé; Cameroon

Introduction

Embryofetopathy is a condition affecting first the embryo, then the fetus and which can lead to malformations or damage to already formed organs [1] The causes are numerous, including infectious agents. The infectious agents for which the risk of embryo-fetal pathology is best known are Toxoplasma. Gondii, the rubivirus which are respectively responsible for toxoplasmosis and rubella; Cytomegalovirus (CMV) and Herpes Simplex Virus (HSV) type 1 and type 2, all from the Herpesviridae family [2].

In Europe, some authors reported a toxoplasmosis seroprevalence of 43% in France [3]. In sub-Saharan Africa, in urban areas, toxoplasmosis seroprevalence during pregnancy varies between 31% and 60% [4,5]. In Cameroon, in 2011, the seroprevalence of

anti- Toxoplasma Immunoglobulin G (IgG) and Immunoglobulin M (IgM) was 70% and 2.73%, respectively [6]. The risk of mother-to-child transmission of toxoplasmosis depends on the gestational age at the time of maternal infection. It is less than 5% in the first trimester and can reach 90% in the last days of gestation. Conversely, fetal damage is more severe the earlier the infection occurs in pregnancy [7].

Before the introduction of rubella vaccination, rubella epidemics resulted in rates of congenital rubella syndrome of 0.8 to 4.0 per 1,000 live births [8]. After 1970, the incidence of rubella declined markedly and has been maintained at an average endemic rate of 4 per 100,000 people per year in Canada. This represents an average of 1,000 reported cases per year, ranging from 237 to 2,450 nevertheless, the rate of congenital infection following maternal rubella has been reported to be 85% in the first trimester, between 36% and 54% in the second trimester and between 30% and 60% in the third trimester; with a striking transmission rate of 100% during the last month of pregnancy [2,9].

In 2019, the French National Academy of Medicine reported Cytomegalovirus (CMV) infection as the most frequent cause of congenital infection, with a prevalence between 0.3% and 1% [10]. Congenital CMV infection can result from transplacental passage of CMV during a primary infection or maternal reinfection. The risk of clinically detectable infection in the newborn is higher in cases of maternal primary infection, particularly during the first half of pregnancy [2].

According to the World Health Organization (WHO), an estimated 3.7 billion people under the age of 50 (67%) are infected with HSV-1 worldwide and 491 million people aged 15 to 49 (13%) are infected with HSV-2 worldwide. Congenital HSV infection is associated with high levels of morbidity and mortality. The most common form of transmission occurs at birth, through direct contact with lesions or asymptomatic viral shedding [11].

Embryo-fetopathies are responsible for numerous complications during pregnancy and congenital malformations affecting several other organs, including the eye [2]. Indeed, according to a 2013 study in Greece, ocular toxoplasmosis was congenital in 7% of cases [12].

The most common manifestation of congenital toxoplasmosis is chorioretinitis, but other ophthalmological manifestations exist [13]. Ophthalmological pathologies are frequently found in congenital rubella. Cataracts were the first reported teratogenic effect of gestational rubella and retinal defects, iris-lens adhesion, microphthalmia, retinitis pigmentosa and strabismus are further examples of abnormalities in this condition [2,14]. Ocular involvement in congenital CMV infection most often results in chorioretinitis, followed by microphthalmia and strabismus [15]. Congenital HSV infections include ocular abnormalities such as chorioretinitis, microphthalmia, keratoconjunctivitis and optic atrophy [16].

A child's early learning is highly dependent on their vision. All these ocular manifestations have an impact on those affected and can affect their visual prognosis. This is an extremely serious problem, given the years of life without vision and the social cost of this disability [17].

Despite studies conducted on the ocular effects of infectious embryofetopathies , many questions remain worldwide, particularly in Africa and Cameroon, where very few studies have been carried out on this subject to date. The objective of this study was to investigate the ophthalmological manifestations observed in children with infectious embryofetopathy at the Yaoundé Gynecology, Obstetrics and Pediatrics Hospital.

Materials and Methods

We conducted a descriptive cross-sectional study with retrospective and prospective data collection at the ophthalmology and pediatrics unit of the Yaoundé Gynecology, Obstetrics and Pediatrics Hospital. We collected the records of patients seen from January 5, 2017, to December 30, 2021 (a period of 5 years). The data collection period lasted 4 months: from January 2022 to April 2022. We included all patients diagnosed with infectious embryo-fetopathy whose records were complete. in the pediatric department, whose guardians could be reached by telephone and had given their consent. We excluded from the study patients with progressively deteriorating conditions and those who withdrew during the study. We used consecutive, non-exhaustive sampling.

The variables studied were sociodemographic data (age, sex, education level), prenatal history (pregnancy monitoring, maternal TORCH serology), perinatal and postnatal history, pediatric medical history, surgical history, ophthalmological history, immuno -allergic history and family history. Clinical ophthalmological data (visual acuity measurement; oculomotor function test; data from examination of the adnexa, anterior and posterior segments and intraocular pressure measurement) and the results of brain CT scans were recorded.

We proceeded as follows: we went to the archives department of the pediatrics service at HGOPY, where we accessed the files of children with infectious embryo-fetopathy followed from January 5 , 2017, to December 30, 2021. We selected the eligible files. For all these files, we recorded the epidemiological and clinical data, as well as the CT scan lesions cerebral. We contacted the parents of the patients whose files were selected by telephone. The ophthalmological examination was carried out at the ophthalmology department of HGOPY. The ophthalmological examination, performed in compliance with barrier measures, included: visual acuity assessment, which consisted of evaluating monocular light pursuit and measuring distance visual acuity using the Rossano- Weiss charts in children able to cooperate; oculomotor testing: this consisted of assessing the mobility of the eyeball along its different axes of movement; and intraocular pressure measurement: measured using a forced-air tonometer in children able to cooperate. Biomicroscopy allowed us to examine the adnexa, the anterior segment (cornea, iris, pupil, lens, aqueous humor) and the dilated fundus for better visualization (vitreous humor, optic disc, macula, retinal vessels). Direct ophthalmoscopy using an ophthalmoscope was also performed when biomicroscopy was difficult. It was done after pupillary dilation with tropicamide. (2 mg /0.4 ml) 1 drop in each eye every 10 minutes for 30 minutes.

The data were analyzed using Epi-info 7 software as well as Excel 2016. Clearance was obtained from the Intentional Ethics Committee for Human Health Research (CIERSH) of the Yaoundé Gynecology-Obstetrics and Pediatrics Hospital and from the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I (FMSB UYI). We conducted this study while strictly respecting patient anonymity, using numbered data collection forms. The confidentiality of the information provided in the examination forms and patient files was maintained.

Results

1. Socio-demographic Characteristics

The study included 20 patients followed for infectious embryo-fetopathy, representing 40 eyes. Males were the most represented sex, comprising 55% (n=11) of the study population, with a sex ratio of 1.2. The mean age was 39 months (3 years and 3 months) ± 25 months [2 months, 9 years] and the median age was 36 months. The age group from 24 months (2 years) to 60 months (5 years) was the most represented (Table 1).

Age Ranges (Months)	Staff	Frequencies (%)
[1 - 24]	6	30
[24 - 60]	11	55
[60 - 120]	3	15

Table 1: Distribution of patients according to age groups (n=20).

School-aged patients (≥ 3 years) represented 60% of the total sample. The proportion of children actually attending school was 16.6% (n=2).

Personal History

Prenatal History

The patients' mothers were between 17 and 38 years old. Among them, 20% (n=4) were primiparous. Pregnancy monitoring began in the 2nd trimester in 85% (n=17) of cases, in the 1st trimester in 15% (n=3) and 20% (n=4) of the mothers had fewer than 4 ANC (antenatal care) visits. Regarding biological monitoring, 40% (n=8) of the mothers had not had serology for toxoplasmosis and rubella; 15% (n=3) of positive serology for toxoplasmosis during pregnancy were recorded, all carried out in the 2nd trimester, including two positive serologies for IgG and one positive serology for IgM. No positive serology for rubella was found in the mothers' pregnancy follow-up records. We found a mother who was seropositive for the Human Immunodeficiency Virus (HIV)

and was undergoing antiretroviral treatment (Table 2).

Variables		Staff	Frequencies (%)
Age Ranges of Mothers (years)	[15 – 25]	5	25
	[25 – 35]	13	65
	[35 - 45]	2	10
Start of the CPN	1st quarter	3	15
	2nd quarter	17	85
Number of CPNs	Less than 4	4	20
	More than 4	16	80
HIV Serology	Positive	1	5
	Negative	19	95
Toxoplasmosis Serology	Positive	3	15
	Negative	9	45
	Not done	8	40
Rubella Serology	Positive	0	0
	Negative	12	60
	Not done	8	40

Table 2: Distribution of patients according to prenatal history (n=20).

Perinatal History

90% (n=18) of the patients were born vaginally and 70% (n=14) were born at term. Birth Weights (BW) were normal in 80% (n=16); the mean BW was 2998 g ± 482.7 g [2000 g, 3800 g]. Head circumferences at birth were measured in 16 patients. The mean head circumference was 33.5 ± 3 cm [30 cm, 36 cm] (Table 3).

Variables		Number (n)	Frequency (%)
Term of Delivery	In the long term	14	70
	Premature	2	10
	Post-date	4	20
Delivery Route	Low	18	90
	High	2	10
Birth Weight (g)	Little PN	4	20
	Normal	16	80
Head Circumference (cm)	[30 - 32]	6	30
	[33 - 36]	10	50
	Unknown	4	20
PN: birth weight			

Table 3: Distribution of patients according to perinatal history (n=20).

Postnatal History

At birth, 40% (n=8) of patients received neonatal resuscitation and 62.5% (n=5) of them were hospitalized for neonatal asphyxia. The neonatal hospitalization rate was 40% (Fig. 1).

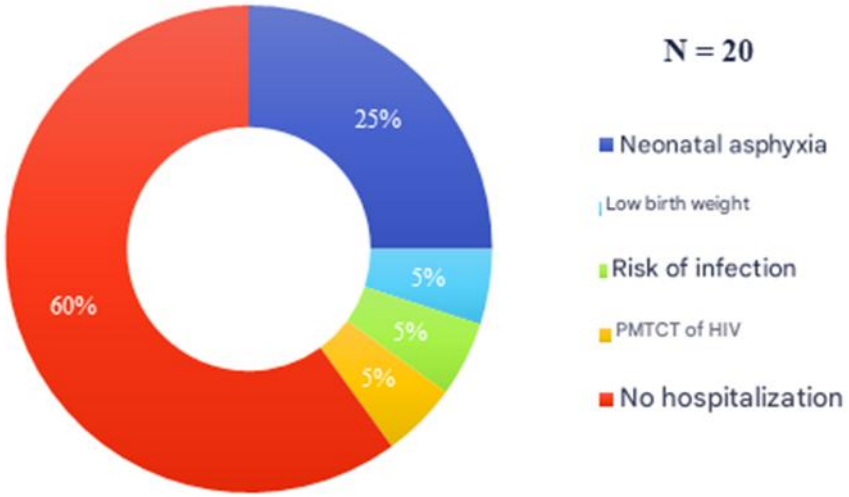

Figure 1: Distribution of children according to outcomes after childbirth.

History of Immuno -Allergic Disorders

None of the patients were HIV-positive and the Expanded Program on Immunization (EPI) vaccination follow-up was up to date for their age for each of them.

General Clinical Characteristics

Initial Symptoms

The mean age at onset of clinical signs was 5.7 ± 5 months [0, 24] months. Psychomotor developmental delay was the most common disorder, occurring in 85% (n=17), followed by microcephaly in 50% (n=10) of cases (Table 4).

General Clinical Signs	Number (n)	Frequency (%)
Delay in psychomotor development	17	85
Epilepsy	10	50
Microcephaly	10	50
Motor deficit	3	15
Hearing impairment	1	5

Table 4: Distribution of patients according to general clinical signs (n=20).

The most frequently encountered ophthalmological sign was BAV in 40% (n=8) of cases (Table 5).

Ophthalmological Signs	Number (n)	Frequency (%)
DVA*	8	40
Microphthalmia	3	15
Strabismus	3	15
Leukocoria	2	10
* decreased visual acuity		

Table 5: Distribution of patients according to ophthalmological clinical signs (n=20).

CT Scan Lesions

tomography was performed in 85% (n=17) of cases. Parenchymal calcifications were the main CT scan finding in 70.5% (n=12) followed by cortical atrophy in 41.1% (n=7) (Fig. 2).

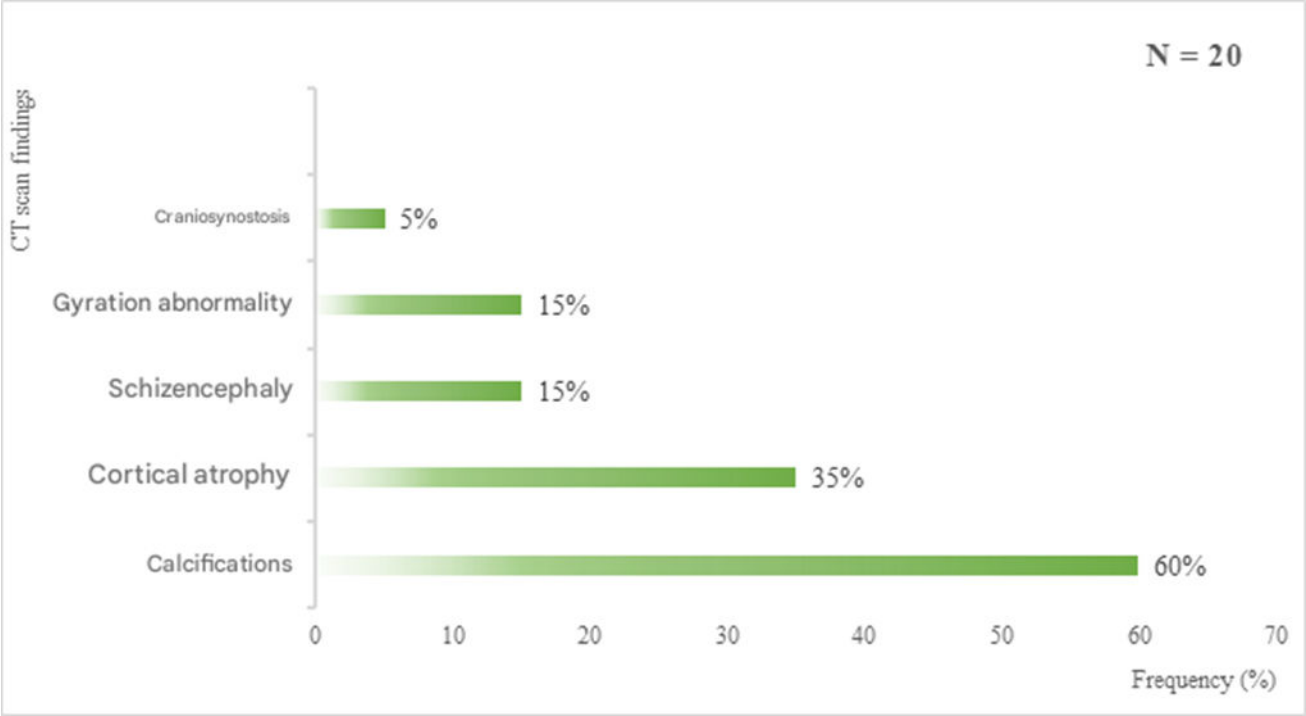

Figure 2: Distribution of patients according to scanographic signs.

Neurological and Sensory Sequelae

A proportion of 75% (n=15) of the patients were being treated for chronic conditions, most often cerebral palsy (n=14) and one case of autism. The treatment initiated in 60% (n=9) of them was antiepileptic drug-based medication. An optical correction prescription was noted in 10% (n=2) of patients.

Etiologies

Based on clinical and paraclinical findings, the diagnosis was directed towards a specific pathogen in 45% of cases. CMV infection was the most frequent (25%) (Table 6).

Suspected Infection	Number (n)			Frequency (%)
	Seroconversion	CT Scan Lesion	Total	
Toxoplasmosis	1	3	4	20
Rubella	-	-	-	-
CMV	0	5	5	25
HSV 1 or 2	-	-	-	-
Undetermined			11	55

Table 6: Distribution of patients according to etiology (N=20).

Data from the Current Ophthalmological Examination

Functional Signs

Decreased Visual Acuity (DVA) was observed in 8 patients, followed by strabismus and ptosis (3 patients) (Fig. 3).

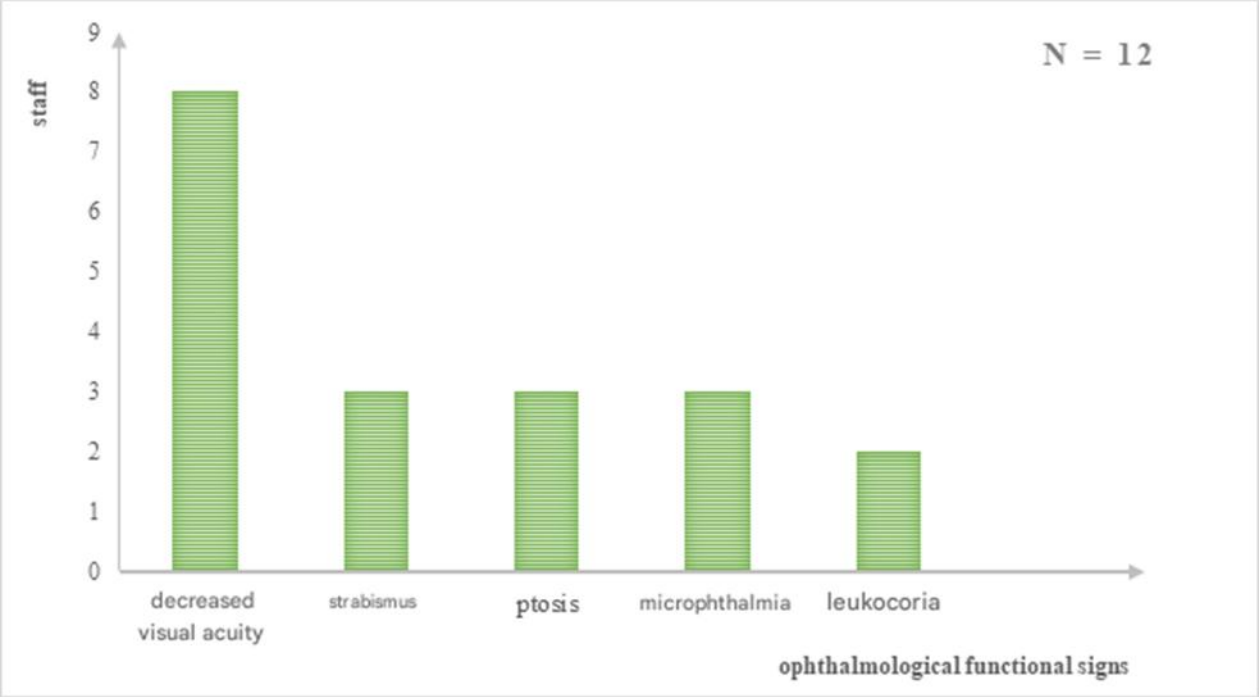

Figure 3: Distribution of patients according to ophthalmological functional signs.

Clinical Signs

Of the 40 eyes examined, ophthalmological manifestations were observed in 18 eyes, representing 45% (12 patients) of the study population. Among these patients, 54.5% (n=6) had binocular disorders. For 10% (n=2) of the population, we observed blindness but no structural abnormality in the ophthalmological examinations performed chorioretinitis scars (4 eyes), microphthalmia (3 eyes) (Fig. 4).

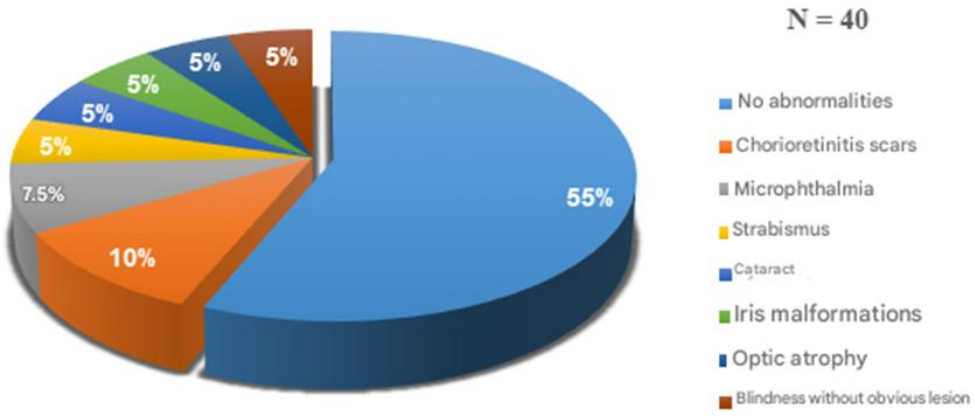

Figure 4: Distribution of eyes according to ophthalmological manifestations.

Of the 20 patients examined, cooperation was obtained with only 2 patients.

- Visual Acuity Assessment

Cooperative patient group (02) had useful distance visual acuity (> 3/10). In the non-cooperative patients, we assessed light tracking: 12 out of 40 eyes did not track the light.

- Eyelid Examination

Eyelid abnormalities were found in 9 eyes, the most frequent being small palpebral fissures and ptosis (3 eyes) (Fig. 5).

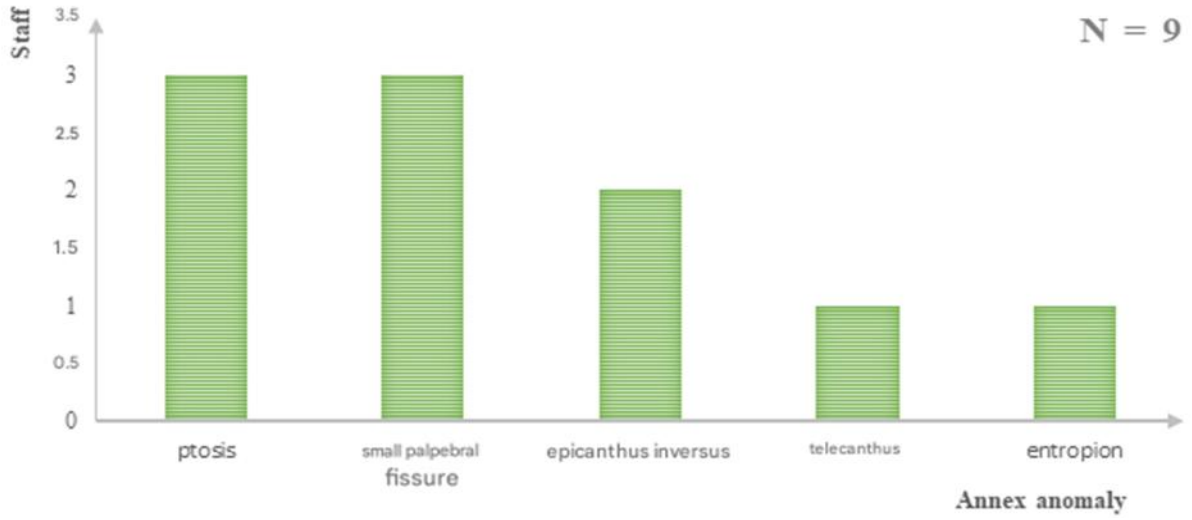

Figure 5: Distribution of anomalies in the annexes.

Anterior Segment Examination

Anterior segment abnormalities were observed in 6 eyes: microcornea (3 eyes), 2 partial cataracts (2 eyes) and one bilateral iris coloboma (Table 7).

Structure	Anomaly	Number (n)	Frequency (%)
Cornea	Microcornea	3	7.5
Iris	Coloboma	2	5
Pupil	Absence of photomotor reflex	2	5
Crystalline	Partial cataract	2	5

Table 7: Distribution of eyes according to anterior segment anomalies (N=40).

Examination of the Posterior Segment

Fundus examination of four eyes could not be performed due to the inaccessibility of the posterior segment. Abnormalities were found in seven eyes and chorioretinitis scarring was observed in four eyes (Table 8).

Structure	Anomaly	Number (n)	Frequency (%)
Vitreous Body	Whitish mass	1	2.7
Retina	Chorioretinitis scars	4	11.1
Optic Nerve	Optic atrophy	2	5.5

Table 8: Distribution of eyes according to posterior segment anomalies (N=36).

Discussion

Sample Size

From January 1, 2017, to December 31, 2021, a period of 5 years, we enrolled 20 patients with infectious embryo-fetopathy. In 2012, Saghrouni, et al., identified 21 cases of congenital toxoplasmosis in Tunisia over an 11-year period (from 2000 to 2011) [18]. In Switzerland, in 2019, Huillier, et al., obtained a sample of 39 patients with congenital toxoplasmosis over a 33-year study period (from 1982 to 2015) [19]. Jin, et al., in 2017, obtained 237 patients with congenital CMV infection over a 31-year period [15]. Lahbil, et al. In 2007, they obtained a sample of 26 patients with congenital ocular rubella over a 4-year period (2001 to 2005) [20]. Lu, et al., in 2016, obtained a sample of 45 patients with symptomatic TORCH embryo-fetopathy with congenital cataract [21].

The sample sizes in these studies are larger than ours. This could be explained by the shorter duration of our study compared to those of many of them. Furthermore, these studies indicate that infectious embryo-fetal diseases are rare conditions.

Epidemiological Characteristics

Sex

According to data from the literature, embryofetopathies affect boys and girls in varying proportions. Thus, in our series, males were predominant (55%), with a sex ratio of 1.2. This result was similar to that of Jin, et al., who had a sex ratio of 1.2 [15]. In 2005, Garweg, et al., also found a sex ratio of 1.2 in patients with ocular manifestations of congenital toxoplasmosis in France [22]. However, this result differs from that of Lahbil, et al., who had 56.25% female sex in the study population of patients with congenital rubella, for a sex ratio of 0.7 [20]. In 2016, Lu, et al., found a sex ratio of 0.9 in patients with congenital cataracts due to TORCH infections [21].

Age

The mean age in our series was 39 months ± 25 months. The most represented age group was 24 to 60 months. This result is close to that of Lu, et al., who reported a mean age of 19.57 months ± 22.16 months [21]. The fact that the first clinical signs generally appear during the first year of life could explain the young age of the patients [23].

School Enrollment Rates

The proportion of school-aged patients (≥ 3 years) was 60%. Among them, 16.6% were enrolled in school. This result can be explained by the fact that 75% of our study population suffered from chronic neurological conditions with impaired language acquisition and age-appropriate social interaction. Cerebral palsy was the most common.

Personal History

Pregnancy monitoring began in the second trimester in 85% of cases and in the first trimester in 15%. Among these women, 20% had fewer than four prenatal visits (ANC). Regarding biological monitoring, 40% of mothers had not undergone serological testing for toxoplasmosis and rubella. This could be due to some mothers not understanding the importance of ANC for healthy pregnancies, nor the importance of TORCH infection screening. This could be explained by a lack of awareness about the consequences of these infections. Added to this is certainly the lack of financial resources in a context where there is no universal health coverage Among the serologies performed, a proportion of 15% were positive for toxoplasmosis during pregnancy, all carried out in the 2nd trimester, including two positive serologies for IgG and one positive serology for IgM . The late performance of the toxoplasmosis serologies could justify the predominance of IgG serology compared to IgM. Indeed, since IgM are markers of an active infection, vertical transmission of the germ would probably have occurred in the 1st trimester of pregnancy, the period most associated with fetal malformations [24].

Of the 20 patients seen, 70% were born at term. In the 2013 study by Townsend, et al., on congenital CMV infections in the UK, there was a higher proportion of patients born at term (94%) [23]. Birth weights were normal in 80% of cases, with a mean birth weight of 29,987 g ± 482.7 g. This result is similar to that of Jin, et al., who found a mean birth weight of 2,820 g ± 804 g [15]. Neonatal asphyxia was the most frequently reported reason for hospitalization (25%). These cases were probably due to acute fetal distress and gynecological causes.

Neurological and Sensory Sequelae

Seventy-five percent of patients were being treated for chronic conditions, most often cerebral palsy (n=14). This condition is very frequently associated with psychomotor delay [13,25]. In 2019, in a study conducted at HGOPY, Nguefack, et al., demonstrated that cerebral palsy was found in 92.7% of patients with psychomotor delay [26] . One case of autism was reported. The association between CMV and autistic disorders has been suspected for years. However, the role of CMV in the development of autistic disorders remains to be clarified [27]. The prevalence of congenital CMV was 5.3% among children with autistic disorders [27]. Optical correction was prescribed for 10% of patients. The patients concerned by these prescriptions had strabismus, for which optical correction is a treatment of choice [28]. However, we noted that the patients were not compliant with this treatment. Their children's restlessness was the main reason given by the parents for not adhering to the corrective lens-wearing protocol.

Etiologies

In our sample, CMV infection was the most frequent (25%). This result is consistent with the literature, which describes CMV as the most common cause of congenital infection [10]. Similarly, while they had only 39 cases of congenital toxoplasmosis in Switzerland between 1982 and 2015, Huillier, et al., found a similar number of cases of congenital CMV, 38 in total, in 2017 alone [19]. Diagnostic uncertainty was observed in 55% of cases. This could be explained by fact that CMV and HSV 1 and 2 serology are not routinely requested during pregnancy monitoring.

General Clinical Characteristics

Initial Symptomatology

The mean age at onset of clinical signs was 5.7 ± 5 months. This result is consistent with that of Townsend, et al., for whom all moderate and severe sequelae of congenital CMV infection were apparent during the first year of life [23]. Psychomotor developmental delay was the most frequently observed disorder (85%), followed by microcephaly (50%). Numerous neurological manifestations of infectious embryo-fetopathies have been described in the literature. Lahbil, et al., reported that 31.25% of their study population had psychomotor delay and 12.5% had microcephaly [20]. Whereas Jin, et al., found 35.2% and 54.3% respectively for psychomotor delay and microcephaly [15].

Nevertheless, our results are superior to those of these studies. This could be explained by the fact that, as the patients were selected from the pediatric department of HGOPY, more specifically from neuropediatrics, the majority of the first signs encountered were neurological in nature. The most common ophthalmological sign was decreased visual acuity in 40% of cases, most often the absence of eye tracking, a sign that quickly raises parental concern. In 2010, in a study on bilateral blindness and low vision in children at HGOPY, Bella, et al., found that the conditions were primarily intrauterine (41.8%), including infectious embryo-fetopathies [17].

CT Scan Lesions

Among the additional tests requested for etiological investigation, cerebral computed tomography was performed in 85% of cases. The literature has shown that since its introduction, cerebral computed tomography has been widely used for the diagnosis of congenital CMV infections, not only to detect CNS lesions, but also to establish the prognosis [86]. Intracranial calcifications were the main radiological finding in 70.5% of cases. This result is not far from that of Garweg, et al., found intracranial calcifications in 96% of patients with neuro-ocular manifestations of congenital toxoplasmosis [22]. Among them, 16% had CT scan images of cortical atrophy. In contrast, Saghrouni, et al., showed that intracranial calcifications were the most common anomaly with a frequency of 14.28% but with a rate lower than ours [18].

In 2018, Kwak, et al., reported that the occurrence of developmental delay is significantly correlated with the presence of polymicrogyria, Ventriculomegaly, calcifications and white matter involvement have also been described [31].

Current Ophthalmological Examination

In 90% of patients, we were unable to assess visual acuity. Our population included many infants and children with cerebral palsy, some of whom had delayed speech and comprehension difficulties. Consequently, cooperation was not obtained. In our series, in the evaluation of monocular light tracking, 30% of the eyes did not follow the light. This result is higher than that of Jin, et al., who found a 10% rate of absence of light pursuit [15] . This difference could be explained by the fact that, unlike the patients in their series, most of our patients did not have ophthalmological follow-up. Consequently, many lesions had the opportunity to worsen.

We found two cases of strabismus. Strabismus is a common sign in congenital toxoplasmosis and CMV infection. According to Coats, et al., strabismus was observed in 12 of 42 (29%) symptomatic patients [27]. Jin, et al., found 25.2% of patients with strabismus in a series of 186 patients with congenital CMV [15]. Garweg, et al., reported 16% of patients with strabismus among those with ocular involvement in congenital toxoplasmosis [22]. Microphthalmia was found in 7.5% of the eyes examined. This result is close to that of Garweg, et al., who found 5.4% of patients with microphthalmia, as well as in that of Saghrouni, et al., who had 9.5% microphthalmic patients [18,22]. In contrast, Lahbil, et al., found 40.6% microphthalmia in a population of patients with congenital rubella [20] . Thus, congenital rubella appears to be a stronger cause of microphthalmia.

In our series, we found two cases of unilateral partial cataracts. In 2020, Domngang, et al., in a study on congenital cataracts in a hospital setting in Mbalmayo, reported 10.2% of cases due to congenital rubella [32]. Furthermore, toxoplasmosis has been implicated in the occurrence of congenital cataracts, as in the case report by Eballe, et al., who described a case at HGOPY in 2010 [33].

Lu, et al., found 45 cases of congenital cataracts with positive TORCH serology, of which 57.7% were due to CMV and 31.1% to HSV types 1 and 2 [21]. In the literature, cataracts are identified as the main ocular manifestation of congenital rubella [2]. Thus, in a series of 16 patients with congenital rubella, Lahbil, et al., found 25 eyes (78.1%) with congenital cataracts [20].

Microcornea was observed in three cases in our series. We note that they were all associated with microphthalmia. The iris malformation observed in our series was a bilateral iris coloboma. This malformation was also described by Lahbil, et al., chorioretinitis scarring and optic atrophy are ocular manifestations that have been described many times [20]. In 2018, Capretti, et al., described, in a population of 48 children with symptomatic CMV infection, 39% of visual sequelae diagnosed in the neonatal period, primarily retinal scarring [34].

Coats, et al., found that visual impairment in patients with congenital CMV infection was mainly due to optic atrophy in 6 out of 16 eyes (37%) and macular scarring in 2 out of 16 eyes (13%) [27]. Garweg, et al., of 430 patients with congenital toxoplasmosis, 130 (30.2%) had chorioretinitis and 2 cases of optic atrophy [22]. Jin, et al., reported 12.9% of retinal lesions due to chorioretinitis and 4.3% of optic atrophy [15].

We also described a whitish vitreous mass in one eye that required further investigation as the diagnosis was uncertain. It could have been a retinoblastoma, a persistent hyaloid membrane or another entity [20]. In 10% of the population, we observed blindness but no structural abnormalities on ophthalmological examinations. Despite the lack of investigation, damage to the visual cortex in the occipital lobe is a possibility. Cortical visual impairment was found in 8 out of 16 eyes (50%) by Coats, et al., [27].

Limitations of the Study

It was difficult for us to definitively identify the pathogens responsible for the various lesions observed both clinically and paraclinically. Furthermore, TORCH serological tests were not performed in a timely manner and follow-up was not conducted for positive cases. The patients' lack of cooperation due to their neurological disabilities limited the performance of certain ophthalmological examinations, particularly visual acuity assessment and intraocular pressure measurement. The unavailability of electrophysiological tests rendered the description of some of the abnormalities found incomplete. We were unable to provide images from examinations of the posterior segment of the eye. Moreover, children often require sedation for retinal photography, but the necessary equipment was not available in the ophthalmology department.

Conclusion

This study revealed that the most frequently implicated pathogen in embryofetopathies was CMV. Psychomotor developmental delay was the most common neurological disorder, while decreased visual acuity was the most frequent ophthalmological sign. Ophthalmological manifestations were observed in 45% of the study population, the most frequent being chorioretinitis scars (10%) and microphthalmia (7.5%). Systematic screening from the first trimester of pregnancy is necessary through TORCH serology testing. Regular ophthalmological follow-up is necessary, including a multidisciplinary approach.

Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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All authors have contributed equally to this work and have reviewed and approved the final manuscript for publication.

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Not Applicable.

References

1. July P, Allilaire JF. Dictionary of Psychiatry. Dict Acad Med. 2000;1:133.
2. Campos VS de, Calaza KC, Adesse D. Implications of TORCH diseases in retinal development: Focus on congenital toxoplasmosis. Front Cell Infect Microbiol. 2020;10:577.
3. Villena I, Ancelle T, Delmas C, Garcia P, Brézin AP, Thulliez P, et al. Congenital toxoplasmosis in France in 2007: First results from a national surveillance system. Euro Surveill. 2010;15:19600.
4. Bamba S, Some DA, Chemla C, Geers R, Guiguemde TR, Villena I. Serological analysis of peri-pregnancy toxoplasmosis: Risk assessment and perspectives of prenatal screening in Burkina Faso. Pan Afr Med J. 2012;12:43.
5. Adoubryn KD, Ouhon J, Nemer J, Yapo CG, Assoumou A, Ahoba JM. Serological screening for acquired toxoplasmosis in women of childbearing age in Yopougon, Côte d'Ivoire. Bull Soc Pathol Exot. 2004;97:345-8.
6. Njunda AL, Assob JCN, Nsagha DS, Kamga HL, Nde PF, Yugah VC. Seroprevalence of Toxoplasma gondii among pregnant women in Cameroon. J Public Health Afr. 2011;2:e24.
7. Garcia-Méric P, Franck J, Dumon H, Piarroux R. Management of congenital toxoplasmosis in France. Presse Med. 2010;39:530-8.
8. World Health Organization. Rubella vaccines: WHO position paper. Wkly Epidemiol Rec. 2011;86:301-16.
9. Robinson J. Canadian Pediatric Society. Prevention of congenital rubella syndrome. Paediatr Child Health. 2007;12:795-7.
10. Leruez-Ville M, Ville Y. Epidemiology and diagnosis of congenital cytomegalovirus infection. Bull Acad Natl Med. 2020;204:126-36.
11. Fa F, Laup L, Mandelbrot L, Sibiude J, Picone O. Fetal and neonatal abnormalities due to congenital herpes simplex virus infection: review. Prenat Diagn. 2020;40:408-14.
12. Asproudis I, Koumpoulis I, Kalogeropoulos C, Sotiropoulos G, Papassava M, Aspiotis M. Ocular toxoplasmosis in a neonate with congenital infection: case report. Clin Ophthalmol. 2013;7:2249-52.
13. Kodjikian L. Congenital ocular toxoplasmosis. 2009.
14. Campos VS, Calaza KC, Adesse D. Implications of TORCH diseases in retinal development. Front Cell Infect Microbiol. 2020;10.
15. Jin H, Demmler-Harrison GJ, Coats DK, Paysse EA, Bhatt A, Edmond JC, et al. Long-term visual and ocular sequelae in congenital cytomegalovirus infection. Pediatr Infect Dis J. 2017;36:877-82.
16. Leung KK, Hon K, Yeung A, Leung AK, Man E. Congenital infections in Hong Kong: overview of TORCH. Hong Kong Med J. 2020.
17. Bella LA, Eballe AO, Kouam JM. Bilateral blindness and visual impairment in children 0-5 years at Yaoundé hospital. Cah Santé. 2010;20:35-9.
18. Saghrouni F, Khammari I, Ben Abdeljelil J, Yaacoub A, Gaïed Meksi S, Ach H, et al. Congenital toxoplasmosis: report of 21 cases. J Pediatr Childcare. 2013;26:83-9.
19. L'Huillier AG, Crisinel PA. Congenital toxoplasmosis and CMV in Switzerland in 2019. Rev Med Suisse. 2020;16:361-4.
20. Lahbil D, Souldi L, Rais L, Lamari H, El Kettani A, Zaghloul K. Manifestation of congenital rubella syndrome: clinical and epidemiologic aspects. Bull Soc Belge Ophtalmol. 2007;13-20.
21. Lu B, Yang Y. Detection of TORCH pathogens in children with congenital cataracts. Exp Ther Med. 2016;12:1159-64.
22. Garweg JG, Kodjikian L, Peyron F, Binquet C, Fleury J, Grange JD, et al. Congenital ocular toxoplasmosis: Ocular manifestations and prognosis after early diagnosis. Klin Monbl Augenheilkd. 2005;222:721-7.
23. Townsend CL, Forsgren M, Ahlfors K, Ivarsson SA, Tookey PA, Peckham CS. Long-term outcomes of congenital CMV infection in Sweden and the UK. Clin Infect Dis. 2013;56:1232-9.
24. Hohlfeld P, Daffos F, Costa JM, Forestier F, Solé Y, Vidaud M. Prenatal diagnosis of congenital toxoplasmosis: New approach. J Pediatr Puericult. 1993;6:341-6.
25. Wallon M, Garweg J, Abrahamowicz M. Ophthalmic outcomes of congenital toxoplasmosis followed until adolescence.

Pediatrics. 2014.
26. Nguefack S, Djifack Tetinou F, Mope Sitchepin N. Malnutrition in children with psychomotor developmental delay. 2019.
27. Coats DK, Demmler GJ, Paysse EA, Du LT, Libby C. Ophthalmologic findings in congenital cytomegalovirus infection. J AAPOS. 2000;4:110-6.
28. Dohvoma VA, Ebana Mvogo SR, Mvilongo CT, Epee E, Ebana Mvogo C. Neglected childhood strabismus: Epidemiological, clinical, therapeutic aspects. J Fr Ophtalmol. 2020;43:774-8.
29. Boppana SB, Fowler KB, Vaid Y, Hedlund G, Stagno S, Britt WJ, et al. Neuroradiography findings and long-term outcome in congenital CMV infection. Pediatrics. 1997;99:409-14.
30. Noyola DE, Demmler GJ, Nelson CT, Griesser C, Williamson WD, Atkins JT, et al. Early neurodevelopmental predictors in congenital CMV infection. J Pediatr. 2001;138:325-31.
31. Kwak M, Yum MS, Yeh HR, Kim HJ, Ko TS. MRI findings as prognostic factors in congenital CMV infection. Pediatr Neurol. 2018;83:14-8.
32. Domngang C, Chofor TH, Matip E, Epee E, Kagmeni G, Bella A. Etiological and morphological profile of congenital cataracts in Mbalmayo, Cameroon. Rev Med Pharm. 2020;10:1072-80.
33. Eballe AO, Ellong A, Zoua MEA, Bella LA, Ngeufack S, Kouam JM, et al. Cerebral and ocular congenital toxoplasmosis with West syndrome. Clin Ophthalmol. 2010;4:861-4.
34. Capretti MG, Marsico C, Guidelli Guidi S, Ciardella A, Simonazzi G, Galletti S, et al. Neonatal and long-term ophthalmologic findings in congenital CMV infection. J Clin Virol. 2017;97:59-63.