



Original article

Prevalence of Neonatal Conjunctivitis In Togo: An Update

Les Conjonctivites Néonatales au Togo: Mise à Jour

Ayena Koffi Didier¹, Santos Kam¹, Diallo Jean W², Vonor Kokou², Nagbe Yawa N², Balo Komi²

Abstract

1: Hôpital de Bè
2: CHU Sylvanus Olympio
3 : Faculté des Sciences de la Santé de Bobo-Dioulasso, Burkina Faso

Corresponding author :

Dr Ayena K. Didier
08 BP 8986 Lomé
Tél 00228 22 19 73 58 / Fax : 00228 2222 6082
Mail : didier23fr@yahoo.fr

Keywords: Neonatal conjunctivitis, Epidemiology, Black Africa, Togo

Mots clés : Conjonctivite néonatale, épidémiologie, Afrique noire, Togo

Conflit d'intérêt: aucun

Purpose. To estimate the incidence rate of neonatal conjunctivitis in Togo and identify the main etiologies. **Patients and Methods.** This was a cross-sectional survey from March 19th to May 13th 2011, in seven health centers in Togo (4 in the south and 3 in the north). All newborns in these centers were examined to identify clinical signs of conjunctivitis. Cytological and bacteriological examination (CBE) of conjunctival secretions was carried out on suspect newborns children. **Results.** During the study period, 507 newborns babies were examined including 265 boys and 242 girls. The mean age at examination was 3.7 days. Thirty-five newborns babies had conjunctivitis (6.9%). 11 (37.1%) of these cases of conjunctivitis were diagnosed in the first four days of life. Twenty-five of these newborns children were delivered vaginally (71.4%) against 10 by caesarean section (28.6%). All mothers of newborns patients reported signs and symptoms of sexually transmitted infections (STIs) during the third trimester of pregnancy. On CBE, *Staphylococcus aureus* was found in 25.7% of cases. **Conclusion.** Despite the extension of neonatal conjunctivitis prophylaxis by the method of Crede, this disease is still endemic in our region. Neonatal conjunctivitis' eradication requires treatment of STIs among pregnant women followed by information on the prevention of infections inside the neonatal care centers and at home by applying simple rules of hygiene.

Résumé

But. Le but de ce travail était de d'évaluer la prévalence des conjonctivites néonatales au Togo et d'identifier les germes en cause. **Patients et Méthodes.** Il s'agit d'une étude transversale dans 7 formations sanitaires du Togo dont 4 au sud et 3 au nord. Tous les nouveau-nés (NNés) suivis dans ces centres ont été examinés à la recherche de signes de conjonctivite. Un examen cytologique et bactériologique (ECB) des sécrétions conjonctivales a été réalisé chez les NNés suspects afin d'isoler un germe. **Résultats.** Durant la période d'étude, 507 NNés ont été examinés dont 265 garçons et 242 filles. L'âge moyen était de 3,7 jours. Trente cinq NNés présentaient une conjonctivite (6,9 %). 11 (37,1 %) de ces cas de conjonctivites ont été observés au cours des quatre premiers jours de vie. Vingt cinq de ces NNés étaient nés par voie basse (71,4 %) contre 10 par voie haute (28,6 %). Toutes les mères des NNés malades ont eu un syndrome d'infection sexuellement transmissible (IST) au cours du troisième trimestre de grossesse. À l'ECB des sécrétions, le *Staphylococcus aureus* a été le seul germe, retrouvé dans 25,7 % des cas. **Conclusion.** Malgré la vulgarisation de la prophylaxie de la conjonctivite néonatale par la méthode de Créde, elle persiste encore dans notre région. Éradiquer la conjonctivite néonatale nécessite le traitement des IST chez les gestantes associé à une éducation sur la prévention des infections en milieu de soins néonataux et à domicile par l'application des règles d'hygiène simples.

INTRODUCTION

According to World Health Organization (WHO), neonatal conjunctivitis is a conjunctival inflammation that occurs in the course of the first 28 days of life.¹ Gonococchia conjunctivitis called also purulent ophthalmia is the classic cause of neonatal blindness, but other pyogenic germs may be found. The diagnosis of neonatal conjunctivitis is mainly clinical, but cytological and bacteriological examination (CBE) of conjunctival secretions is necessary to identify the etiology, which may lead to treatment readjustment.^{2,3}

The first neonatal conjunctivitis description was done by Saint-Yves in 1722. In 1820, Vetch set forth the hypothesis of the infection spreading through blood from the urethra to the eye. Knoner in 1884 and Morax in 1903 demonstrated the transmission of infection during childbirth. In 1835, Juliard was the first to advise the use of silver nitrate in the prevention of neonatal conjunctivitis before Crede recommends its systematic use with newborns children (NBC). In 1942, Friedenwald reported the first positive results in blindness risk reducing.⁴ Due to its side effects, mainly chemical conjunctivitis, WHO has removed the silver nitrate to the benefit of other antibiotics and antiseptics.⁵ The neonatal conjunctivitis prophylaxis by the method of Crede is widespread in Togo, but the epidemiological situation of neonatal conjunctivitis remains largely unknown. The aim of this work was to estimate the incidence rate of neonatal conjunctivitis in Togo and identify its main etiologies.

PATIENTS AND METHODS

Togo is a West Africa country. It is situated between the 6th and 11th degrees of north latitude and the 0th and 2nd degrees of longitude east of Greenwich. Togo covers an area of 56,600 km² with a population of 6,000,000 inhabitants. Rectangular, it stretches from north to south for 600 km between three (3) neighboring countries of Benin to the east, west Ghana and Burkina Faso to the north. The southern part of the country opens on the coast (Gulf of Guinea) with a coastline of 50 km in length. Togo has a tropical climate. It is influenced by the southwest monsoon, wet oceanic wind bringing rain and wind that of the harmattan dry wind, medium-cold, semi-hot which causes drought. In south of Togo there are four seasons namely a long rainy season, a short rainy season interrupted by two dry seasons. In the northern part, we have a dry season and a rainy season.

Aneho, located 45 km east of Lome is the capital of the District of Lakes. Glidji village is part of the Lakes district. Its area is 65 km² with a population of 19,109 inhabitants. It has four peripheral health units (PHU) namely, Agoegan, Glidji, Zalive Assoucope and Zowla, each of them comprises a maternity.

Kara is the capital of Kozah district and Kara region. It is located 410 km north of Lome, Togo capital city. According to the general directorate of statistics, the population of Kozah district estimated at 229,798 inhabitants with 5,515 births in 2011, remains rural within 63% of cases. On the health front, the District

owns a university hospital (UH), a regional hospital (RH), a district hospital (DH) and thirty peripheral health units (PHU).

Our work was a cross-sectional study in seven health facilities including 3 in the district of Kozah namely UH of Kara, the RH of Tomde and PHU of Landa and 4 PHU in the Lakes district from March 19th to May 13th, 2009 in Kozah district and from March 19th to May 13th, 2011 in Lakes district. These centers were selected because of their high delivery activity and the quality of their post natal activities including children vaccinations. NBC aged from 0 to 28 days were examined systematically for signs of conjunctivitis during their first vaccinations visit. The diagnosis of conjunctivitis on a newborn child was done when the mother reported eye redness, eye secretions or a watering with conjunctival hyperemia after physical examination. The following parameters were collected: age, sex, functional and physical signs and immediate care to the newborn child, presence of a syndrome of sexually transmitted infections (STIs) during pregnancy and mode of delivery. Cytology examination (CE) of conjunctival secretions was carried out in newborns children clinically suspected of neonatal conjunctivitis. The mother's consent was obtained before any examination of the newborn. Because of PHU's lack of laboratory, samples were sent to the bacteriology laboratories of Aneho hospital in the south and of the UH of Kara in north. This contributed to an extension of the delay in the delivery of samples from other centers. The collected data were processed and analyzed using SPSS 12.0.

RESULTS

Five hundred and seven newborns babies were recruited in seven health centers. The distribution according to center is summarized in Table 1.

Table I: newborns repartition according to health center

Health Center	Number	%	District
PHU Agoegan	44	8.7	Lakes
PHU Glidji	80	15.8	Lakes
PHU Zalive-Assoucope	24	4.7	Lakes
PHU Zowla	11	2.2	Lakes
Kara TH	200	39.4	Kozah
RH Tomde	107	21.1	Kozah
PHU Landa	41	8.1	Kozah
Total	507	100	

PHU = peripheral health unit. RH = regional hospital
TH = teaching hospital

Males were more represented, 52.3% meaning 265 boys against 242 females 47.7%. The sex ratio (M / F) was 1.1. The average age of newborns children was 3.7 days with a range of 0 to 26 days. The age group of 0-4 days represented 72.7% of the sample (figure 1).

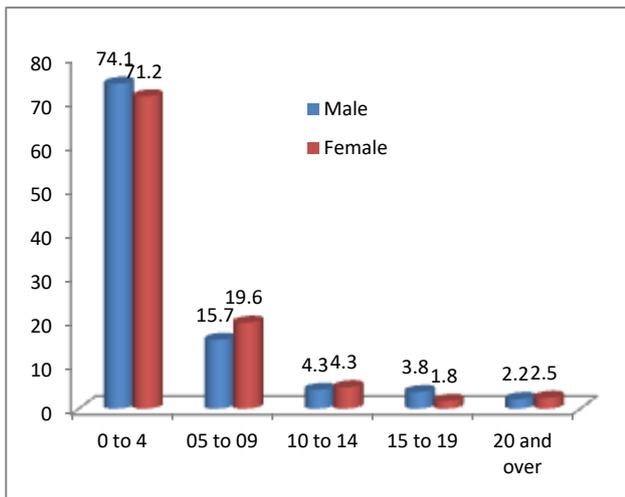


Figure 1: Examined newborns repartition according to age and gender

Thirty-five (35) newborns showed signs of conjunctivitis, giving an incidence rate of 6.9% ($CI_{95\%} = 2.8\%$). The incidence rate was 4.4% (7/159) in the district of Lakes and 8.0% (28/348) in Kozah district. Among them 23 (65.7%) were recruited at Kara University Hospital, 2 (5.7%) at Tomde regional hospital, 3 (8.6%) at Landa peripheral health unit (PHU), 4 (11.4%) at Glidji PHU, 2 (5.7%) at Agoegan PHU and 1 (2.8%) at Zalive Assoucope PHU. They were male in 21 cases (60.0%) and female in 14 cases (40.0%). The distribution of newborns babies suffering from conjunctivitis according to the age is shown in figure 2. The age group of 0-4 days was the most represented (37.1%) followed by that of 5-9 days (31.4%).

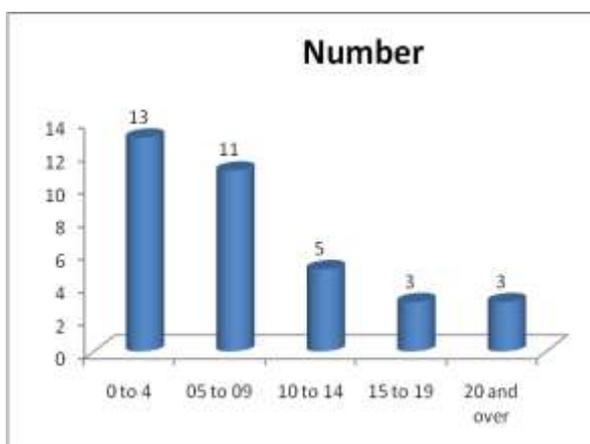


Figure 2: Neonatal conjunctivitis repartition according to age

The main functional symptoms reported by mothers were red eyes in all cases. Abnormal secretions were present in 10 cases and tears in 10 cases.

Vaginal delivery was present in 25 cases (71.4%) and caesarean sections in 10 (28.6%). The amniotic fluid was stained in 25 cases (71.4%). History of sexually transmitted infection syndrome was reported in 35 mothers of infected newborns babies. It was vaginal discharge in the third trimester of pregnancy in 28 mothers (80%) and vaginal itching in 7 (20%). Premature rupture of membranes was reported in 4 cases (11.4%).

At delivery, the instillation of antibiotic or antiseptic eye drops was reported in 25 newborns patients (71.4%) while in 10 others, instillation of mother's milk was 28.6%). Physical examination showed conjunctival hyperemia in all cases, eyelid edema in 15 cases (42.8%), conjunctival secretions in 10 cases (28.6%) - purulent in 6 cases and clear in 4 cases-, and chemosis in 11 cases (31.4%). At CBE *Staphylococcus aureus* was the only organism isolated, present in 9 cases (25.7%), while samples were sterile in 26 cases (74.3%). All babies and mothers were treated with antibiotics. Cure of conjunctivitis was present after a follow-up period of two weeks.

DISCUSSION

This multicenter cross-sectional survey allowed us to find a hospital incidence rate of neonatal conjunctivitis of 6.9% in the Lakes and Kozah districts. Those centers were chosen based on their high neonatal activity on the one hand and in respect of the health pyramid in Togo on the other hand. In fact, the country's health system is pyramidal with PHU at primary level, district hospitals (DH) and regional hospitals (RH) at the secondary and university hospitals (UH) to tertiary. Moreover, the fact that this survey is held both in some health facilities of the south (Lakes) and those in the north (Kozah) contributes to better assess the national incidence rate of neonatal conjunctivitis in Togo.

In our study, any clinical suspicion of neonatal conjunctivitis led to cytology and bacteriological examination (CBE) of conjunctival secretions. Several studies also report results from the ECB conjunctival secretions.⁶⁻⁹ Yip and al reported that the "polymerase chain reaction" (PCR) was more sensitive in the diagnosis of neonatal conjunctivitis with *Chlamydia* than the CBE.¹⁰ We failed to achieve the biologic diagnosis of "polymerase chain reaction" (PCR) due to technical limitations of the laboratory. Maybe the availability of this technology could help us identify other causal germ as *Chlamydia trachomatis* and *Neisseria gonorrhoeae*.

In our study, neonatal conjunctivitis prophylaxis consisted of instillation of antibiotic or antiseptic eye drops in 71.4% of cases, while in Brazil, the prophylaxis was found to be applied at rate of 86% in neonatal health units.¹¹ Salpietro and al showed that about 30% of newborn babies exposed to infection during childbirth are victims of neonatal conjunctivitis in the absence of prophylaxis against 2% when silver nitrate is instilled from birth as a preventive.¹² Despite the extension of prophylaxis of neonatal conjunctivitis by the method of Crede, their incidence rate varies from 1.8 to 22.3% in the literature.^{5,6,9,13-18} The incidence rates varied across countries (table II) and reached its highest level with newborn babies whose mothers were infected by the human immunodeficiency virus (HIV) type 1 in the absence of prophylaxis.¹⁷

Table II: Prevalence rate of neonatal conjunctivitis according to certain authors.

Authors	Country	Publication year	Sample	Prevalence rate
Our study	Togo		507	6.9 %
Iroha ¹³	Nigeria	1998	150	1.8 %
Nie ¹⁴	Chine	2008	15 398	2.539 %
Amini ⁹	Iran	2008	4021	4.9 %
Verma ¹⁵	India	1994	2959	7.2 %
Djibo ¹⁸	Niger	2011	486	10.29 %
Couto ¹⁶	Bresil	2007	6 243	12.1 %
Gul ⁶	Pakistan	2008	1010	17 %
Gichuhi ¹⁷	Kenya	2009	452	22.3 %

The incidence rate of neonatal conjunctivitis was found high in the Lakes and Kozah districts. There is a need for planning actions to reduce it. We think it is necessary to prevent and treat systematically STI syndromes among pregnant women, strengthen rigorously Crede method among newborn babies. Information and communication sessions will help reach the involved sanitary staff. The broadcasting of this information through several radio stations in different mother tongues will reach the whole population.

The CBE isolated *Staphylococcus aureus* in 25.7% of cases, in our series. Sarvikivi and al reported 24% of laboratory confirmation of infection with newborn

babies.⁷ *Staphylococcus aureus* was increasingly isolated from conjunctival secretions of newborn children in some publications.^{6, 8,9} Gul and al have systematically examined newborn babies of D1, D3, D7, D14, D21 and D28 of life and isolated *Staphylococcus aureus* in 65% of cases in Islamabad, Pakistan.⁶ Olatunji and al in Nigeria have found this germ in 43.1% of cases.¹⁹ Because this germ is not a cause of STI syndrome, its presence may be due to a hand transmitted or iatrogenic contamination as reported by some authors.^{6,18-21} It is very important to emphasize, in both caregivers and parents on hand, body and clothing hygiene during the administration of care to newborn babies and their daily keeping. Some authors have not found *Staphylococcus aureus* in their series.^{18, 22-24} These authors found classic germs such as *Chlamydia trachomatis*, *Neisseria gonorrhoeae* and *Klebsiella spp.*

CONCLUSION

Despite the extension of prophylaxis of neonatal conjunctivitis by the method of Crede, the latter is still persistent in our region. Neonatal conjunctivitis eradication requires treatment of STIs among pregnant women followed by information on the prevention of infections inside the centers of neonatal care and at home by applying simple rules of hygiene.

REFERENCES

1. OMS. Conjonctivite du nouveau-né : prévention et traitement au niveau des soins de santé primaire. Geneve. 1986 ; pp 35.
2. Nataf R, Coscas G. Conjonctivites purulentes. Editions techniques. Encycl Med Chir Ophthalmologie. Paris 1965 ; 21130, C10 : 1-5.
3. Liotet S. Diagnostic biologique des conjonctivites. Encycl Med Chir Ophthalmologie. Paris 1982; 21130 B10 : 3.
4. Cohen R. Les infections oculaires courantes de l'enfant. Med Enfance. 2000 ; 20 : 409-11.
5. Zuppa AA, D'Andrea V, Catenazzi P, Scorrano A, Romagnoli C. Ophthalmia neonatorum : what kind of prophylaxis? J Matern Fetal Neonatal Med. 2011; 24(6) : 769-73.
6. Gul SS, Jamal M, Khan NJ. Ophthalmia neonatorum. Coll Physicians Surg Pak. 2010; 20(9) : 595-8.
7. Sarvikivi E, Kärki T, Lyttikäinen O, Finnish NICU Prevalence Study Group. Repeated prevalence surveys of healthcare-associated infections in Finnish neonatal intensive care units. J Hosp Infect. 2010; 76(2) : 156-60.
8. Borer A, Livshiz-Riven I, Golan A, et al. Hospital-acquired conjunctivitis in a neonatal intensive care unit : Bacterial etiology and susceptibility patterns. Am J Infect Control. 2010; 38(8) : 650-2.
9. Amini E, Ghasemi M, Daneshjou K. A five-year study in Iran of ophthalmia neonatorum : prevalence and etiology. Med Sci Monit. 2008; 14(2) : 90-6.
10. Yip PP, Chan WH, Yip KT, Que TL, Kwong NS, Ho CK. The use of polymerase chain reaction assay versus conventional methods in detecting neonatal chlamydial conjunctivitis. J Pediatr Ophthalmol Strabismus. 2008; 45(4) : 234-9.
11. Abreu Caligaris LS, Medina NH, Durkin SR, Haro-Muñoz E, Chinen NH. Assessment of the current ocular health practices within neonatal units in the City of São Paulo, Brazil. Ophthalmic Epidemiol. 2010; 17(5) : 333-7.
12. Salpietro CD, Bisignano G, Fulia F, Marino A, Barberi I. La conjonctivite à *Chlamydia trachomatis* du nouveau-né. Arch Pédiatr. 1999; 6 : 317-20.
13. Iroha E O, Kesah CN, Egri Okwaji M T, Odugbemi TO. Bacterial Eye infection in neonates, a prospective study in neonatal unit. West Africa J Med. 1998; 17 : 168-72.
14. Nie WY, Wu HR, Qi YS et al. A pilot study of ocular diseases screening for neonates in China. Zhonghua Yan Ke Za Zhi. 2008; 44(6) : 497-502.
15. Verma M, Chhatwal J, Varughese PV. Neonatal conjunctivitis: a profile. Indian Pediatr. 1994; 31 : 1357-61.
16. Couto RC, Carvalho EA, Pedrosa TM, Pedroso ER, Neto MC, Biscione FM. A 10-year prospective surveillance of nosocomial infections in neonatal intensive care units. Am J Infect Control. 2007; 35(3) : 183-9.
17. Gichuhi S, Bosire R, Mbori-Ngacha D et al. Risk factors for neonatal conjunctivitis in babies of HIV-1 infected mothers. Ophthalmic Epidemiol. 2009; 16(6) : 337-45.
18. Djibo H, Amza A, Kamaye IM, Nassirou A. Annales de l'Université Abdou Moumouni. 2011; XII-A : 120-5.
19. Olatunji FO, Fadeyi A, Ayanniyi AA, Akanbi AA 2nd. Non-gonococcal bacterial agents of conjunctivitis and their antibiotic susceptibility patterns in Ilorin, Nigeria. Afr J Med Sci. 2007; 36(3) : 243-7.
20. Di Bartolomeo S, Higa M, Janer M, Pennisi A, Balbin G, Priore G. Neonatal conjunctivitis in a hospital at Gran Buenos Aires. Last 5 years up-date. Rev Argent Microbiol. 2005; 37(3) : 139-41.
21. Wu J, Liu J, Feng ZC, Huang JJ, Wu G. Influence of premature rupture of membranes on neonatal health. Zhonghua Er Ke Za Zhi. 2009; 47(6) : 452-6.
22. Chen CJ, Starr CE. Epidemiology of gram-negative conjunctivitis in neonatal intensive care unit patients. Am J Ophthalmol. 2008; 145(6) : 966-70.
23. Kakar S, Bhalla P, Maria A, Rana M, Chawla R, Mathur NB. *Chlamydia trachomatis* causing neonatal conjunctivitis in a tertiary care center. Indian J Med Microbiol. 2010; 28(1) : 45-7.
24. Rours IGJG, Hammerschlag MR, Ott A et al. *Chlamydia trachomatis* as a cause of neonatal conjunctivitis in Dutch infants. Pediatrics. 2008; 121(2) : 321-6.