

Prevalence of Acute Bronchiolitis in Infants: About 167 Cases Seen in Pediatric Consultation at the Reference Health Center of the Commune I of Bamako (Mali)

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Abstract: Introduction: Bronchiolitis is a common respiratory disease in pediatrics. Its acute onset manifestations are most often observed in infants under 24 months of age, but at this age the respiratory system remains immature. The main pathogen of acute bronchiolitis in infants is respiratory syncytial virus (RSV). **Materials and method:** This is a descriptive and prospective study of the acute bronchiolitis in infants aged 0 to 24 months received at the pediatric consultation of the Reference Health Center of the Commune I of Bamako de Mars 2019 to February 2020. **Results:** In 12 months, 167 cases of acute bronchiolitis were seen at the pediatric consultation. The prevalence of bronchiolitis was 1.85%, the average age of infants was 8 months, and the boy/girl sex ratio was 1.6. The month of September represented the peak (31.1%). Infants aged 1 to 10 months accounted for 60% of hospitalizations. Mortality was 5.4%. **Conclusion:** bronchiolitis is a common pediatric consultation pathology, it remains worrying for parents with a more or less negligible mortality rate.

Keywords: Bronchiolitis, prevalence, Commune I, Bamako.

INTRODUCTION

Acute bronchiolitis is the most common seasonal viral respiratory infection in infants. In France, it affects around 30% of infants each winter (460,000 children/year) with an increase of 9% each year since 1996 [1]. It generally occurs in infants under two years of age [2, 3], the predilection age is between 02 and 08 months with frequent hospitalization of those under 12 months of age [2]. The diagnosis of acute bronchiolitis is clinical. The etiology is generally viral; respiratory syncytial virus (RSV) is implicated in 60 to 90% of cases [4].

In the United Kingdom, approximately 1/3 of infants develop bronchiolitis in the first year of life and hospitalization concerns 2 to 3% of them [5], as well as in France 1 to 3% of infants aged one year are hospitalized [6]. In Mali, two studies were carried out in 2014 and 2018 respectively at the Reference Health

Center of the Commune V of Bamako where 3.5% of consultations were acute bronchiolitis [7], and at the CHU Gabriel TOURE where Doumbia AK. *et al.*, [8], carried out a retrospective study covering the period from January to December 2012 in hospitalization. None of these studies can provide a national prevalence. The epidemiological data of bronchiolitis in commune I of Bamako being unknown, the present study aims to determine the prevalence of acute bronchiolitis in infants.

MATERIAL AND METHODS

This was a prospective and descriptive study of cases of bronchiolitis received at the outpatient clinic. It extended over the period from March 2019 to February 2020 and was carried out in pediatrics, at the Reference Health Center of the commune I of Bamako. The Reference Health Center of the commune I, like the other reference health centers, is a second-level public

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establishment which urgently receives referral/evacuation cases from other health structures. Its mission is to support the implementation of the national health policy in Mali. Each Reference Health Center has a specialized infant care service (Pediatrics). During data collection, all infants aged 0 to 24 months seen at the pediatric consultation for a respiratory problem were carefully examined for signs of bronchiolitis. This made it possible to include 167 infants in the study. Excluded from the sample were infants seen for a third episode suggestive of infant asthma, as well as any pathologies considered as a differential diagnosis. Infants whose parents refused participation in the study were not included. The physical examination data were collected using a previously developed survey form.

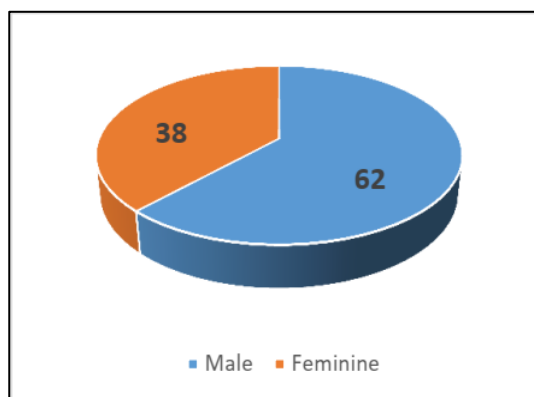
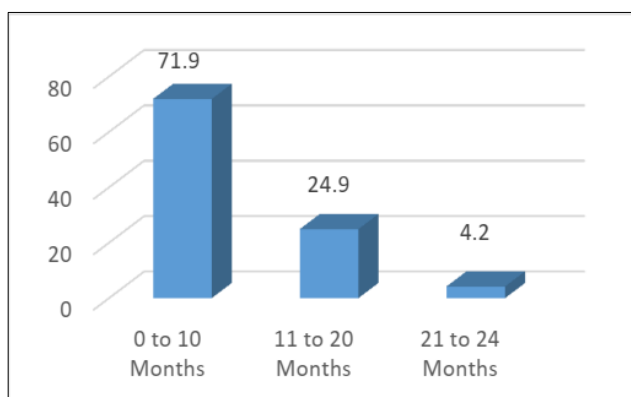
Parents were interviewed for additional information. The variables recorded were: the sociodemographic parameters of the infants (Age, sex), the history of family atopy and the environmental factors of the infant, the reason for consultation and the outcome of the infants (cured, death, referred). The data were processed and analyzed on SPSS version 25 software then entered on world 2016 software. Consent from the administration of the Reference Health Center of Commune I was obtained before the start of the study.

The ethics and anonymity of the participants were preserved

RESULTS

During the study period, 9035 children were seen at the pediatric consultation of the Commune I Health Center, including 167 cases of acute bronchiolitis, a prevalence of 1.85%.

The most predominant reason for consultation was rhinorrhea (71.3%). Boys represented 62%, a sex ratio of 1.6. The average age of the patients was 8 months with a range of 1 to 24 months. Infants aged 0 to 10 months were the majority (71.9%), 24.9% of infants were aged 11 and 20 months. The peak corresponded to the month of September (31.1%). Familial atopies such as: asthma (16.2%), urticaria (35.3%), eczema (44.3%), were found. The infants had a history of prematurity (4.8%), perinatal distress (1.8%), congenital heart disease (3.6%) and atypical dermatosis (3%). Environmental factors were noted in 83.8% of infants. These environmental factors were: passive smoking (72 cases = 43.1%), contact with domestic animals (68 cases = 40.72%) and humidity/mold (4 cases = 2.4%). Treatment of bronchiolitis was carried out in hospital in 3% of cases. Infants aged 1 and 10 months represented 60% of those hospitalized. Mortality was 5.4% (9 cases).



Graphs 1 and 2: Distribution of infants according to age groups and sex

Most infants were aged 0 to 10 months (71.9%), the extreme ages were 1 month to 24 months (figure 1).

Boys were the majority (62%), the sex ratio was 1.6 (figure 2).

Table I: Distribution of infants according to history and environmental factors

Background	Workforce	Percentage
Personal history		
Prematurity	8	4.8
Perinatal suffering	3	1.8
Atypical dermatosis	5	3
Congenital heart disease	6	3.6
Familial atopy		
Asthma	27	16.2
Urticaria	59	35.3
Eczema	74	44.3
Environmental factors		
Passive smoking	72	43.1
Pets	68	40.7
Moisture/mold	4	2.4

Tableau II : Répartition des nourrissons selon le motif de la consultation.

Reasons for consultation	Workforce N= 167	Percentage
Rhinorrhea	119	71.25
Respiratory distress	61	36.5
Cough	92	55.1

The majority of infants had rhinorrhea (71.25%) and cough (55.1%) as the reason for consultation.

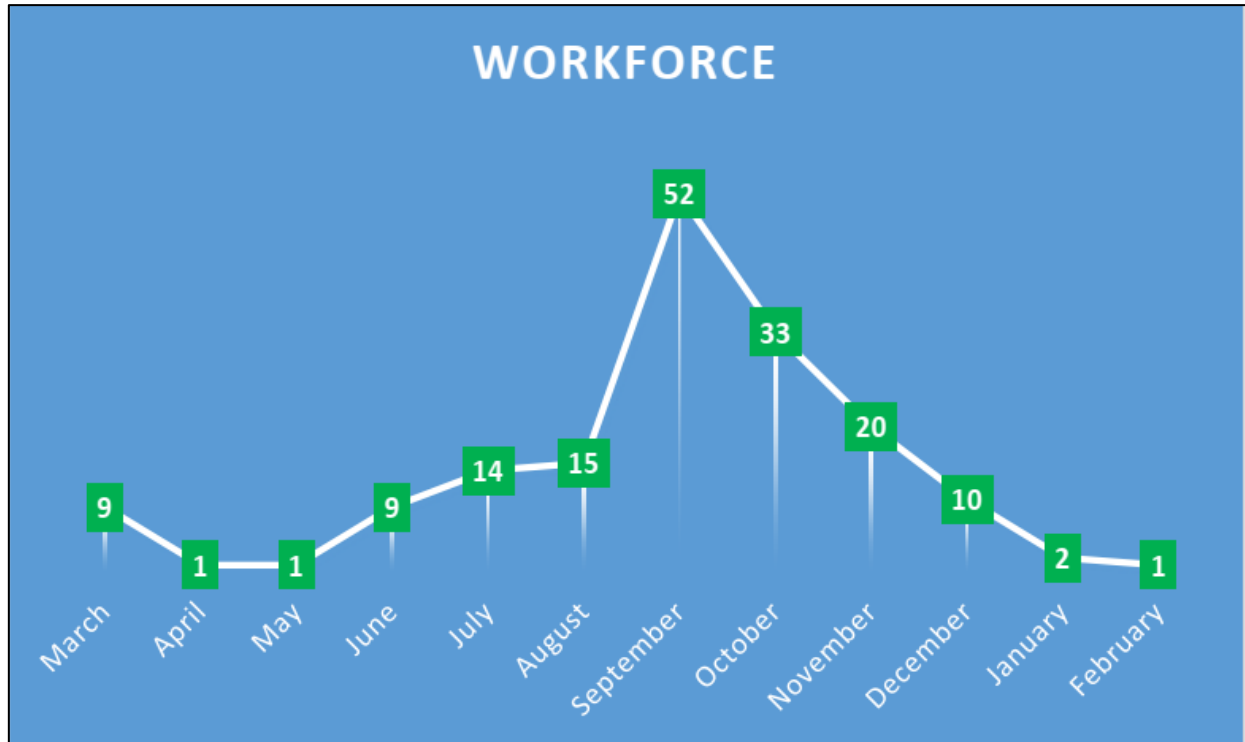


Figure 3: Distribution of infants according to consultation period

Bronchiolitis reached its peak consultation in September (52 cases = 31.1%).

Table III: Distribution of infants according to method of treatment and infants hospitalized according to age

	Workforce	Percentage
Method of treatment (N= 167)		
Ambulatory	162	97
Hospitalization	5	3
Age of hospitalized (N=5)		
0 to 10 months	3	60
11 à 20 months	1	20
21 à 24 months	1	20

The treatment was carried out on an outpatient basis in 97% of cases and 60% of hospitalized cases were less than 11 months old.

Table IV: Distribution of infants according to outcome

Become	Workforcece	percentage
Cured	158	94.6
Deceased	9	5.4
Total	167	100

The evolution under treatment was favorable in 94.6% of cases.

DISCUSSION

Method

This prospective and descriptive study made a contribution to the epidemiology of acute bronchiolitis in infants in Mali, more precisely new prevalence data.

Acute bronchiolitis in infants represented 1.85% of pediatric consultations. This result is lower than that of the Commune V of Bamako in 2014 (3.5%) [7], and consistent with that obtained by Bogne *et al.*, in Cameroon in 2013 (1.6%) [9]. In 2018, at the CHU-Gabriel Touré in Bamako, the hospital frequency of bronchiolitis was 1.05% [8]. The disparity between the results is explained by the period and place of study. Boys represented 62% with a sex ratio of 1.6. This result is consistent with that of other authors in 2021; 2018; 2018 and 2019 [2- 10], which respectively have a sex ratio of 1.5; 1.6; 1.7 and 1.4. According to the author of External courses in the 5th year of medicine [4], 60% of infants with acute bronchiolitis are boys. This male predominance has no plausible explanation. Sex plays no role in the occurrence of bronchiolitis [8], the small size and caliber of the boy's bronchioles constitute a predisposition [10]. The majority of patients were aged between 0 and 10 months (71.9%) with an average age of 8 months. These results are comparable to those of Fatima Dakir [10], who noted in 2021 in Morocco, in a retrospective study, infants aged 1 to 3 months (51%) and 3 to 11 months (32%), i.e. 83% of 1 to 11 months with an average age of 5.38 months. The same trend was observed in other studies in 2013 and 2018 [3- 8], or respectively 76% and 86% of cases less than one year old. This observation can be explained by the fact that infants under one year of age have a less mature respiratory system and therefore are not effective in ensuring effective grooming of the bronchi.

The peak of bronchiolitis was reached in September with 31.1% of cases. This result is comparable with that of a study from Cameroon in 2013 where acute bronchiolitis in infants would be more frequent from September to November with a peak in October [9]. At CHU Gabriel TOURE in 2018, the peak in hospitalizations was noted in November [8]. The period of morbidity changes little, however climatic variations favorable to the expansion of viruses play a role in the occurrence of episodes, which is consistent with the term "seasonal pathology".

Familial atopies found during the study were asthma 16.2%, eczema 44.3% and urticaria 35.3%. Doumbia AK. *et al.*, had 16% familial asthma in 2018[8], other authors [2], in 2019 had 47% familial atopy. The existence of familial atopy such as asthma, allergic rhinitis and atypical eczema reinforces the clues which point towards future asthma in infants [12].

Environmental factors were passive smoking (43.1%), contact with pets (40.7%), humidity and mold (2.4%). These results are comparable to those of O.

Diamoutene in 2014 who had 37.5% passive smoking [7], and significantly higher than those of Echraf M. in 2019 [2], who noted 14.2% passive smoking and 7.9% contact with animals. Echraf M. [2], also had a comparatively humid environment and or mold at 1.9%. Contact with domestic animals is more frequent in Sahelian countries like Mali, due to the liberal practice of domestic breeding. The personal history of the infants was: prematurity (4.8%), perinatal suffering (1.8%), congenital heart disease (3.6%), atypical dermatosis (3%). Echraf M. in his retrospective observational study had comparable results such as congenital heart disease (4.2%) and atypical dermatosis (2.5%); it also had a higher rate of prematurity at 12.4% (in the "first and second episode" series).

A history of prematurity < 36 weeks, congenital heart disease and multiple disabilities are associated with vulnerability [13], which means that they expose one to serious forms of bronchiolitis.

Hospitalization concerned 3% of infants; this result is comparable to that of the study carried out in Normandy where 5% cases were hospitalized [2]. According to the 2018-2019 monitoring report; 13% (n = 63,616) of total emergency room visits among children were for bronchiolitis [2]. The evolution was favorable in 94.6% of cases. These results are comparable to those of the authors [7- 14], which had respectively 93.1%, 98% and 98.6% of cases with a favorable outcome.

Acute bronchiolitis in infants is a pathology with a favorable outcome under treatment. However, environmental and social criteria such as passive smoking, prematurity and young mothers or those with a low socio-economic level are associated with the severity of acute bronchiolitis [2].

CONCLUSION

Acute bronchiolitis in infants is a common pathology in pediatrics. The severity of the episode is due to environmental factors that are often preventable; community awareness-raising focused on these factors could reduce the burden of morbidity and mortality from bronchiolitis in infants.

Conflicts of Interest: This work is free from any conflict of interest.

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