

Acute Respiratory Infections in the Internal Medicine Department of University Hospital of Borgou and Alibori from 2021 to 2023

Comlan Albert Dovonou^{1*}, Cossi Adébayo Alassani¹, Djibril Abdou Badiou¹, Sènan Serge Adè¹, Cossi Angelo Attinsounon¹, Armand Wanvoégbè²

¹Departmental University Hospital Center of Borgou and Alibori, Parakou, Republic of Benin

²Departmental University Hospital Center of Ouémé and Plateau, Parakou, Republic of Benin

Email: *dovcom1@yahoo.fr

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Abstract

Background: Acute respiratory infections are a frequent reason for consultations in internal medicine. Unpredictable in their evolution, these infections can require hospitalization, and can constitute a medical emergency requiring respiratory resuscitation, which is often difficult in our context. **Objective:** To study the frequency and factors associated with Acute Respiratory Infections in the Internal Medicine of Department of CHUD-B/A from 2021 to 2023. **Methodology:** This was a retrospective, descriptive and analytical study covering the period from 2021 to 2023. An exhaustive census list of all patients visited during consultation or hospitalized in the Internal Medicine Service was conducted. This period of survey has met the criteria inclusion design. Data were collected after tabulation of consultation and hospitalization, and medical records using a recount. **Results:** The frequency of Acute Respiratory Infections was 4.16%. The average age of patients was 42.09 ± 18 years old with a slight male predominance, the sex ratio was 1.12. Associated factors were elderly adults and no antibiotic-based self-medication. **Conclusion:** It will therefore be necessary to inform and educate young people for change of behavior; to strengthen the fight against smoking and chronic alcoholism and combat antibiotic-based self-medication in order to prevent Acute Respiratory Infections and their deleterious effects.

Keywords

Frequency, Acute Respiratory infections, Parakou, Benin

1. Introduction

The world faces two health challenges; non-transmitted diseases whose prevalence

continues to increase and the persistence of communicable diseases. Among the latter, tuberculosis, HIV infection and malaria have been subjected to particular attention for several decades. Nowadays, respiratory infections are becoming more and more common and pose a real public health problem. In 2015 of the 56.4 million deaths recorded from all causes, respiratory infections were responsible for 3.2 million cases; they constituted the 3rd cause of mortality after myocardial infarction and stroke [1]. South Africa in the Sahara was particularly affected with almost a quarter of deaths linked to respiratory infections [2]. They were the main causes of death in 9 African countries [3]. In South Africa, they represented the second cause of death among subjects aged 15 and over [4]. These are particularly fatal pathologies in children and the elderly [5]. The agents responsible for respiratory infections are of viral origin as evidenced by the recent Covid-19 pandemic; but especially bacterial with *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Klebsiella pneumoniae* and *Staphylococcus aureus*, which are the most frequently encountered [6]. The factors favoring these infections are multiple and include age, environmental factors, socio-economic factors [7] [8]. In Benin, few studies have focused on respiratory infections, particularly in children under the age of 5 [9] [10]. The northern region is favorable to respiratory infections with its arid climate, especially during harmattan periods where the air is polluted and laden with dust. Authors reported that climatic parameters, such as temperature, rainfall and relative humidity, influence the prevalence of acute respiratory infections (*ARIs*) [11] [12]. In Parakou, a study of children under the age of 5 revealed an *ARIs* prevalence rate of 24.8%. According to the study, the factors associated with *ARIs* were the use of wood/charcoal for cooking, living close to unpaved roads that exposed children to dust, and living with domestic animals [9]. In a recent study, the prevalence of *ARIs* was 74.6% in children aged 0 - 5 years in Cotonou. The associated factors were the mother's age between 18 and 28, the use of charcoal/wood for cooking, children's poor personal hygiene, and cohabitation with domestic animals [10]. In addition, according to the 2019 health statistics yearbook, acute respiratory infections were the second most common reason for consultations among children aged 0 to 5 (17%) after malaria (48.8%) [13]. Studies of acute respiratory infections in adults in Benin are rare. The acute form of these respiratory conditions has drawn our attention given the unfavorable outcome if resuscitation and specific treatment measures are not taken. The present work was therefore initiated to study the frequency and factors associated with acute respiratory infections in adults at CHUD-B/A. The results of this study will make it possible to determine the extent but above all the favorable factors with a view to adopting preventive and curative measures.

2. Study Framework and Methods

Study setting: the study took place in the Internal Medicine Department of the Departmental University Hospital Center of Borgou/Alibori (CHUD-B/A).

Type and period of study: this was a retrospective, descriptive and analytical

study covering the period from January 1, 2021 to December 31, 2023, *i.e.*, a period of 3 years.

Study population: it consisted of all patients seen in consultation or hospitalized in the Internal Medicine Department of CHUD-B/A from 2021 to 2023. All patients of both sexes, aged at least 15 years old and older, with a well-completed medical file and presenting with an acute respiratory infection were included in the study. Patients suffering from heart disease, chronic respiratory infection and those in another department were excluded from the study.

Sampling: an exhaustive census of patients seen in consultation or hospitalized in the Internal Medicine Department of CHUD-B/A during the period from January 1, 2021 to December 31, 2023 was carried out. The records of patients with respiratory infections had been identified. Then, patients with chronic respiratory infections were excluded. Only usable records of patients with acute respiratory infection were considered.

Data collection technique and tool: data collection was operated by analyzing the consultation register, the hospitalization register and patient files. A counting sheet had been drawn up for this purpose.

Variables: the dependent variable was acute respiratory infection, defined as any infection involving the respiratory system that had been evolving for less than two weeks (acute rhinopharyngitis, acute tracheitis, acute tracheobronchitis, pleurisy, acute bronchitis, bronchiolitis, and pneumonia). The independent variables related to sociodemographic data and clinical characteristics.

Data processing and analysis: the data collected was inserted into EpiData 3.1 and analyzed in the Epi info 7.2 and Excel 2013 software; a p-value less than 0.05 was considered significant.

Ethical aspects: authorization from managers at various levels of CHUD-B/A had been obtained. The results obtained were confidential and will be made available to the university authorities and CHUD-B/A for use.

3. Results

A total of 23,878 patients were received in consultation or hospitalized in the Internal Medicine department of CHUD-B/A during the data collection period. Among them, 1612 patients had suffered from respiratory infections, including 990 from acute respiratory infections, *i.e.*, a frequency of 4.16% (990/23,878). Patients suffering from acute respiratory infections presented the following characteristics (**Table 1** and **Table 2**):

- the average age was 42.09 ± 18.06 years with the extremes of 15 years and 90 years; the age group from 15 to 45 was the most represented (65%);
- a predominance of men (52.91%) with a sex ratio of 1.12;
- lived less than 10 km from CHUD-B/A in 59.71% of cases;
- married in 76.21% of cases;
- non-educated in 50.97% of cases;
- traders or sellers in 45.15% of cases; of Bariba ethnicity in 31.55% of cases and Muslims in 61.17%.

Table 1. Epidemiological characteristics of patients suffering from acute respiratory infections at CHUD-Borgou from 2021 to 2023 (n = 990).

	N	%
Age (years)		
<45	643	65
[45 - 60[178	18
≥60	169	17
Gender		
Female	466	47.09
Distance from place of origin to hospital		
<10 km	591	59.71
Marital status		
Married	754	76.21
Education		
Non-educated	505	50.97

Table 2. Clinical characteristics of patients suffering from acute respiratory infections at CHUD-Borgou from 2021 to 2023 (n = 990).

	N	%
Types of ARIs		
Acute Rhinopharyngitis	44	4.37
Acute Tracheitis	14	1.46
Acute Trachea-bronchitis	10	0.97
Pleurisy	10	0.97
Acute Bronchitis	144	14.56
Bronchiolitis	14	1.46
Pneumonia	754	76.21
Main admission symptoms		
Fever	124	12.62
Headache	58	5.83
Chills	10	0.97
Cough	639	64.56
Chest pain	135	13.59
Dyspnea	14	1.46
Chest deformity	5	0.49
Others	5	0.49
Length of hospitalization		
<7 days	337	34

Continued

≥7 days	653	66
Smoking		
Yes	322	32.52
Alcoholism		
Yes	322	32.52

- the type of acute respiratory infections frequently encountered was pneumonia (76.21%) followed by acute bronchitis (14.56%);
- the signs presented on admission were dominated by cough (64.56%) followed by chest pain (13.59%) and fever (12.62%);
- the average length of hospitalization was 10 days with the extremes of 0 days and 29 days;
- smoking and chronic alcoholism were found in 32.52% of cases;
- factors associated with acute respiratory infections were age > 45 years old ($p = 0.01$) and lack of antibiotics self-medication ($p = 0.01$) (**Table 3**).

4. Discussion

The present study was one of the first to focus on adults' acute respiratory infections (ARIs) in hospitals in northern Benin. It was initiated at the end of the Covid-19 pandemic which shook the entire world for two years. No African country was spared. The retrospective nature may be a bias of the study. However, good record keeping and taking into account files over 03 years made it possible to limit the biases relating to the retrospective nature. At the end of the study, the frequency of *ARIs* was 4.16%. This was relatively low but considerable frequency given the multidisciplinary nature of the Internal Medicine department.

In a study carried out in the general population in Nigeria, the frequency of *ARIs* was 2% [14]. This frequency of *ARIs* increased to 10% in a study carried out in the same country but in a hospital environment and precisely in the emergency department [15]. This frequency was higher than that found in the present study due to the location of the study; the emergency department which receives patients from several specialties. Rezoagli [16] also reported a higher frequency varying between 7.1% to 12% in Italy.

Patients suffering from *ARIs* were young adults with a mean age of 42.09 ± 18.06 years. Tchatchouang [6] in Cameroon reported a median age of 50 years. In Tomczyk's study [17] in Guatemala, the patients had an older age of 57 years on average. It was therefore a condition that can affect all age groups with variations depending on the place of study.

A male predominance was observed. This trend was also highlighted by Kurskaya [18] and Sultana [19]. So, they are men at risk for *ARIs*. Studies need to be conducted to confirm this assertion. It should be noted among men that there are risky behaviors such as smoking and riding a motorcycle taxi without protecting their nose.

Table 3. Factors associated with acute respiratory infections at CHUD-Borgou from 2021 to 2023.

	IRAs (%)	P
Age (years)		
<45	0.73	0.01
[45 - 60[1.73	
≥60	1.76	
Gender		
Male	0.98	0.46
Female	0.87	
Marital status		
Married	1.20	0.65
Single	1.33	
Distance from place of origin to hospital		
<10 km	1.01	0.19
≥10 km	0.83	
Self-medication based on antibiotics		
Yes	0.79	0.01
No	1.14	

ARIs was dominated by pneumonia found in 76.21% of cases. The predominance of pneumonia was also reported by Olufemi [15]. This predominance of pneumonia is explained by the fact that the Internal Medicine department receives more diseases of the lower airways while those of the upper airways are managed in the otolaryngology department.

The dominant sign was cough found in 64.56%; which was confirmed by the results of the Koskela study [20].

Factors associated with *ARIs* were advanced age and lack of self-medication with antibiotics. Advanced age was associated with *ARIs* in Latti's study [21]. The advanced age identified as a factor favouring *ARIs* may be the result of long-term exposure to a number of other factors, such as wood smoke, bush fires, air pollution from machinery, and the effects of smoking. Self-medication with antibiotics can have a protective anti-inflammatory effect and also eliminate pathogenic germs responsible for respiratory infections. Tchatchouang [6] reported that 76.6% of patients had already practiced self-medication with antibiotics before their admission. The frequent used antibiotics were *beta-lactams*, *sulfonamides*, *macrolides* and *quinolones*. But we must fight against this practice because in most cases it is poorly carried out and therefore promotes the selection of pathogens resistant to antibiotics.

The main limitation of this study is its retrospective nature, which meant that it was not possible to investigate possible exposure factors directly in the patients.

This also explains the lack of certain information, in particular the circumstances of the onset of the disease, the therapeutic itinerary and previous treatments prior to admission. Furthermore, the data from this study may not reflect the reality in the general population, as this is not a primary care healthcare facility. This represents a potential bias in the prevalence of respiratory infections in adults.

However, this study shows a significant frequency of ARIs in adults. It is therefore necessary to conduct a prospective study to identify the risk factors for exposure, based on existing data for children. This will make it possible to identify the factors that contribute to the occurrence of these infections in adults. Identifying these factors will enable specific interventions to be carried out in the general population to reduce the incidence of these infections.

5. Conclusion

Acute respiratory infections are common in the Internal Medicine department and are dominated by pneumonia. The oldest people are the most affected. Certain practices such as self-medication, smoking and alcoholism must be abandoned for better care and adequate prevention.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Data Collection Form

Data Collection date: /_ // _ // _ // _ // _ // _ // _ // _ /

File number: /_ // _ // _ // _ /

Patient code:

Socio-demographic characteristics

1. Age (years): /_ // _ /

2. Gender: /_ / 1=male, 2=female

3. Occupation: /_ /

1 = Student; 2 = Employee; 3 = Artisan; 4 = Farmer; 5 = Retailer; 6 = Other

4. Distance from place of origin to hospital: /_ / 1 = < 10 km; 2 = > 10 km

5. Level of education: /_ /

1 = Primary; 2 = Secondary; 3 = University; 4 = Non education

6. Religion: /_ / 1 = Christian; 2 = Musselman; 3 = Endogenous; 4 = Atheist

7. Marital status: /_ / 1 =single; 2 = married; 3= divorced; 4 = widow

Clinical characteristics

8. Date of hospitalisation: /_ // _ // _ // _ // _ // _ // _ // _ /

9. Release date: /_ // _ // _ // _ // _ // _ // _ // _ /

10. History

11. Personal History: /_ /

1 = Smoking; 2 = Ethylism; 3 = Smoking and ethylism 4 = None

12. Symptomatology: /_ /

1 = fever; 2 = headache; 3 = chills; 4 = cough; 5 = chest pain; 6 = dyspnoea; 7 = flapping wings of the nose; 8 = internal chest tightness; 9 = regular breathing; 10 = chest deformity; 11 = other symptoms (.....)

13. Type of respiratory infection: /_ /

14. 1 = Acute rhinopharyngitis; 2 = Acute tracheitis; 3 = Acute tracheobronchitis; 4 = Pleurisy; 5 = Acute bronchitis; 6 = Bronchiolitis; 7 = Pneumonia

15. Associated diseases: /_ /

1 = Gastroenteritis; 2 = Anaemia; 3 = Meningitis; 4 = Malaria; 5 = Urinary tract infection; 6 = Diabetes; 7 = Sickle cell disease; 8 = HTA; 9 = AIDS; 10 = Tuberculosis; 11 = None; 12 = Other condition (.....)

16. Self-medication with antibiotics: /_ / 1=Yes; 2 = No

17. Seasonal factors: /_ / 1 = dry season; 2 = rainy season