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# *Peculiarities of Community-Acquired Pneumonia in elderly patients seen in the department of infectious disease at Befelatanana University Hospital; Antananarivo Madagascar.*

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**ABSTRACT**

**Introduction:** Acute Community-Acquired Pneumonia (CAP) is an acute infection of the pulmonary parenchyma. Its incidence increases in the elderly. The evolution towards the severe form is frequent with a pejorative prognosis. **Objective:** The main objective of the present study is to describe the peculiarities of acute community-acquired pneumonia in the elderly. The secondary objectives are to analyze the occurrence of signs of severity as well as the effectiveness of treatment in community-acquired acute pneumonia according to age. **Methodology:** This is a retrospective, descriptive and analytical study of the exposed - unexposed type, carried out in the Infectious Disease Department of the Befelatanana University Hospital. The study period is 5 years (2010 to 2015). Were included all patients admitted to hospital for acute community acquired pneumonitis confirmed on chest X-ray. The exposed cases were represented by patients aged 65 years and over. Unexposed case where represented by patients under 65 years age. **Results:** We collected136 cases of acute community-acquired pneumonia in which 109 were included and 27 were excluded because incomplete data. Among patients over 65 old years, 4 were secondarily excluded for reasons of matching. Cough (p=0,0391), fever (p=0,0232) and sputum (p=0,0022) were significantly lower in patients group of over 65 old years, while severe leukopenia (p=0,0038), normal CRP (p= 0,00098), and signs of severity such as impaired consciousness (p=0,03) and low blood pressure (p= 0,0028) were significantly more frequent. The length of stay of more than 10 days was significantly greater (p=0,001). Age greater than or equal to 65 years is a risk factor for mortality (p = 0.001) and adverse therapeutic response after 72 hours of antibiotic therapy (0.013).

**Conclusion:** Non-specific clinical signs of acute community-acquired pneumonia are common in elderly patients. The form of the disease is often severe with an extended hospital stay and a high mortality risk factor.

**Keywords**: *Community-Acquired Pneumonia, elderly hospitalized patients, Madagascar*.

## Introduction

Community-Acquired Pneumonia (CAP) is an acute infection of the pulmonary parenchyma. It is called community disease because it occurs in extra-hospital settings.

Tis infection happening within the furst 48 hours of hospitalization or 7 days after a hospital visit [1]. It is the leading cause of infectious disease death in the world and the sixth leading cause of death in general [2].

The incidence increases in elderly patients in whom the evolution towards the severe form is frequent, and go with a pejorative prognosis.

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Morbidity increases from 5% among the young adult to 35% among the elderly and mortality from 20% to 50%. Early and effective antibiotic therapy predicts prognosis [4, 5]. This requires rapid diagnosis, accurate assessment of severity, of the mortality risk and the therapeutic response. [6]. However illness presentation in elderly patients is quite often atypical and source of lateness of diagnosis.
Gravity assessment scores and biological markers used usually lose their performance with age [7-10]. It therefore seemed useful to describe the peculiarities of acute community pneumonia in the elderly.
The main objective of the present study is then to describe the peculiarities of acute community-acquired pneumonia in the elderly. The secondary objectives is to analyze the occurrence of severity's signes as well as the effectiveness of treatment in community-acquired acute pneumonia according to age, and then to identify the main factors in the occurrence of severe pneumonitis and treatment failure in adults.

## Materials and methods

This is a retrospective, descriptive and analytical study, observational type exposed, non-exposed carried out in the infectious diseases department of the university hospital Joseph Raseta Befelatanana. The study period is five years (2010 to 2015). During this period we included all patients hospitalized for CAP confirmed on chest x-rays. The exposed cases are patients ≥ 65 years old, and the non-exposed cases are patients less than 65 years old . All exposures and non-exposures responding of the inclusion criteria are selected exhaustively.
Sampling was obtained at a rate of one case for two controls. The recruitment of the study population was done basis the patient file study. Once the patients were selected, their detailed medical record was consulted in order to collect the relevant data to study.

The data was collected using a pre-established coded survey record and then registered on Microsoft Excel 2013. Subsequently, they were analyzed with the R Software version 2.9. The Chi2 test was used to calculate the value of p and the relative risk value (RR) as well as the confidence intervals (CI). A value of $p < 0.05$ is statistically significant, similarly a value of OR different from 1.
This study was carried out after obtaining the agreement of the management and line managers of the infectious diseases department of Joseph Raseta Befelatanana hospital. In addition, all patients hospitalized in this department had to sign on admission a letter of consent stating their acceptance of the care and care provided in this hospital. Given that Joseph Raseta Befelatanana is a University Hospital, a place where many health learners are trained, but also a place of research and care, patients known about the possibility of using their medical information's for research purposes.
The diagnosis of the CAP was based on a chest x ray and the signs of seriousness responded to the recommendation of the AFSSAPS 2010.

## Result

Between January 2010 and January 2015, there were a total of 136 cases of CAP. We included 109 cases that met our selection criteria and excluded 27 cases because incomplete records. The Include group cases are composed of 70 patients < 65 years old and 39 ≥ 65 years old. Among these aged over 65 years old, 4 cases were excluded secondarily for the purpose of matching, such an one exposed for two unexposed (Figure 1). Cough, fever and sputum were significantly lower in people ≥ 65 years old (Table I). Severe leukopenia, normal CRP was significantly more common in patients older than 65 years old (Table II). For severe signs, impaired consciousness and arterial hypotension, multilobular involvement was significantly more frequent in the elderly patient (Table III). In those aged over 65 years old, a hospital stay of more than 10 days was significantly more frequent. This age constitutes a risk factor for unfavorable therapeutic response after 72 hours of antibiotherapy. It constitut a risk factor for mortality (Table IV).

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**DISCUSSION:**

Our studies showed that the signs of CAP already inconsistent in the younger patients are even more pronounced in elders. We found that clinical symptoms such as cough, fever and dyspnea are much more frequent in young people than in those aged over 65 years old (cough was found in 90% in those aged <65 years old compared with 74.14% in those over 65 years old with p = 0.039, fever: 94.28% compared with 51.43% with p <0.05, sputum: 11.43% compared with 51.42% with p = 0.22). This was also confirmed by Metlay and al, who found fever in 93% of patients aged ≤ 65 years old and 60% of patient > 65 years old , cough in 90% of patients aged ≤ 65 years old, and in 60% older than 65 years old. [11] Riquelme and al found that fever was present in only 63.4% of patients older than 65 years old and cough in 80.9% of those > 64 years old. [12] Regarding dyspnea, KotheH and al noted a significant difference with a frequency of 81.7% in patients over 65 years old compared with 68.2% in the youngest (p <0.01) [13]. On the other hand, signs are not specific enough to CAP such as altered consciousness but more common in patients > 65 years old. The clinical presentation of CAP in the elderly is therefore different in comparison of the young patients with a predominance of atypical signs. The sensitivity of the clinical manifestation is thus lower in elder patients in the diagnosis of CAP, which can often be lacking according to our observations. This absence of specific signs in the elderly is explained by the decreased systemic inflammatory response associated by the decreased cough reflex and the mucociliary clearance [14].

For paraclinic signs, we also noted that old age constituted as a risk factor for the absence of biological inflammatory syndrome, with a normal CRP in 54.3% of patients over 65 years old compared with only 2.85% in patients ≤ 65 years old (p <0.05).

Leukopenia (≤4000GB/ml) was observed in 33.42% of patients over 65 years old compared to 8.57% of patients ≤ 65 years old (p = 0.004). Leukocytosis (≥20,000GB/ml) has not been observed in patients over 65 years old. This situation can be the cause of a diagnostic delay and therefore a delay in therapy, which can increase the severity and darken the prognosis in the elderly.

According to the results of our studies, the following signs of severity were more frequent in these populations: systolic blood pressure ≤90 mm Hg (49% against 19%, p = 0, 003), altered consciousness (23% vs. 6%, p = 0.03). Severe CAP is more common in patients aged over 65 years old. This age is a risk factor with a relative risk of 1.92, p = 0.04, an 95% confidence interval [0, 93-3,94], while an age ≤64 years old is a protective factor with a relative risk of 0.52 p = 0.04 and a 95% confidence interval [0.25-1.07] . Our results are consistent with those of Kothe H and al, who noted 16.4% cases of consciousness disorders among patients over 64 years old compared with 5.2% in younger patients, a much more rapid respiratory rate in patients elderly -over 64 years old -with a frequency of 19.8 +/- 6.5 cycle per minute and a frequency of 20.8 +/- 6.6 cycle per minute in the younger p <0.001 [13].

Regarding treatment, an unfavourable response after 72 hours of probabilistic antibiotic therapy was observed in 43% of patients aged over 65 years old compared with 20% for those ≤65 years old. Thus, age over 65 years old is a risk factor for poor therapeutic response with a relative risk of 3, p = 0.01, 95% confidence interval [1.13-8.05], while the lower is a protective factor with a relative risk of 0.3; p = 0.013; a 95% confidence interval [0.12-0.89]. Our results are thus in consistent with those described in the literature. James and al. showed in their study that age is an independent risk factor for host-related antibiotic therapy failure in CAP. They also notes in this study that comorbidities would be a risk factor for this treatment failure. However, it should be noted that in our series there is no significant difference in the comorbidities between the two groups, which may lead to confusion and more incriminating the age factor as a cause of

treatment failure. This may be due to the fact that with age there is inefficiency of cough, loss of pulmonary elasticity, decreased mucociliary clearance, increased functional residual capacity, flattening of the diaphragm, decreased T cell function and reduced interleukins (IL) 1, IL 2 or immunoglobulin type M [15].

Death was observed in 28% of patients over 65 years old, compared with 4% of those aged 65 years old or younger. Thus, age above 65 is a risk factor for mortality with a relative risk of 2.68, p = 0.001 and a 95% confidence interval [1.69-4.26], whereas an older age is a protective factor with a relative risk of 0.13, p = 0.001 and a confidence interval 95% [0.13-0.58]. Gilbert and Fine also estimated that a healthy 60-year-old patient with CAP had a relative mortality risk of 3.0 compared to an identical 30-year-old [16]. Kothe H and al found overall mortality at 6.3% but were higher in patients over 64 years than in those aged less than or equal to 64 years old [13]. Marie TJ and al. found that age was a risk factor for mortality with an Odd ratio at 1.044 for each additional year old [17].

A hospital stay <10 days was observed in 75% of patients aged 64 years old or younger, compared with 41% in patients over 64 years old . The average lenght hospital stay was 11 days for the elderly, compared with 8 days for the younger ones. An age greater than 64 years old thus constitutes a risk factor for a prolonged hospital stay (p = 0.001) whereas a lower age is rather a protective factor. In the literature, several studies have shown that age is an independent risk factor for length of hospital stay. Sutter-Widmer and al. noted in their series that an age greater than 60 years old constitutes a risk factor for prolonged hospitalization with p <0.001 [18]. In the Hironori U and al. series, age over 64 years is also a risk factor for prolonged hospitalization with OR at 2.43 and p <0.001 even in that of Sicras-Mainar and al, who also noted an Odd ratio = 1.1 with p <0.002 [19,20]. This much longer length of hospital stay in elderly patients can be explained by a frequency of poor therapeutic response, the occurrence of complications, and thus a much higher cost of hospitalization as well as the risk of hospitalization and nosocomial infection or decubitus complications.

Therefore, in view of the predominance of frustrated forms, atypical or severe symptoms, we suggest that the diagnosis of CAP should be suspected and chest X-ray should be practice among all elderly patients having a frail health and presenting a frail impaired. That can reduce complications like a risk of progression; and avoid a poor prognosis due to diagnostic and therapeutic delay.

Despite these results, our study presents some limit: it is a monocentric study and then was not representative of all patients hospitalized for a CAP. It was prospective with recruitment of data from records which for some were incomplete. We did not carry out a randomized sampling which is the only method that could guarantee the representativeness of a sample and our recruitment was done in a fixed cohort mode.

## Conclusion

Our study showed that age is an important parameter in the diagnosis and management of CAP. Age greater than or equal to 65 years old is an independent risk factor of severity, complicated outcome, early treatment failure, and mortality during CAP in Malagasy hospitalized patients.

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**Figure I : Sampling characteristic's of the stydied population.**

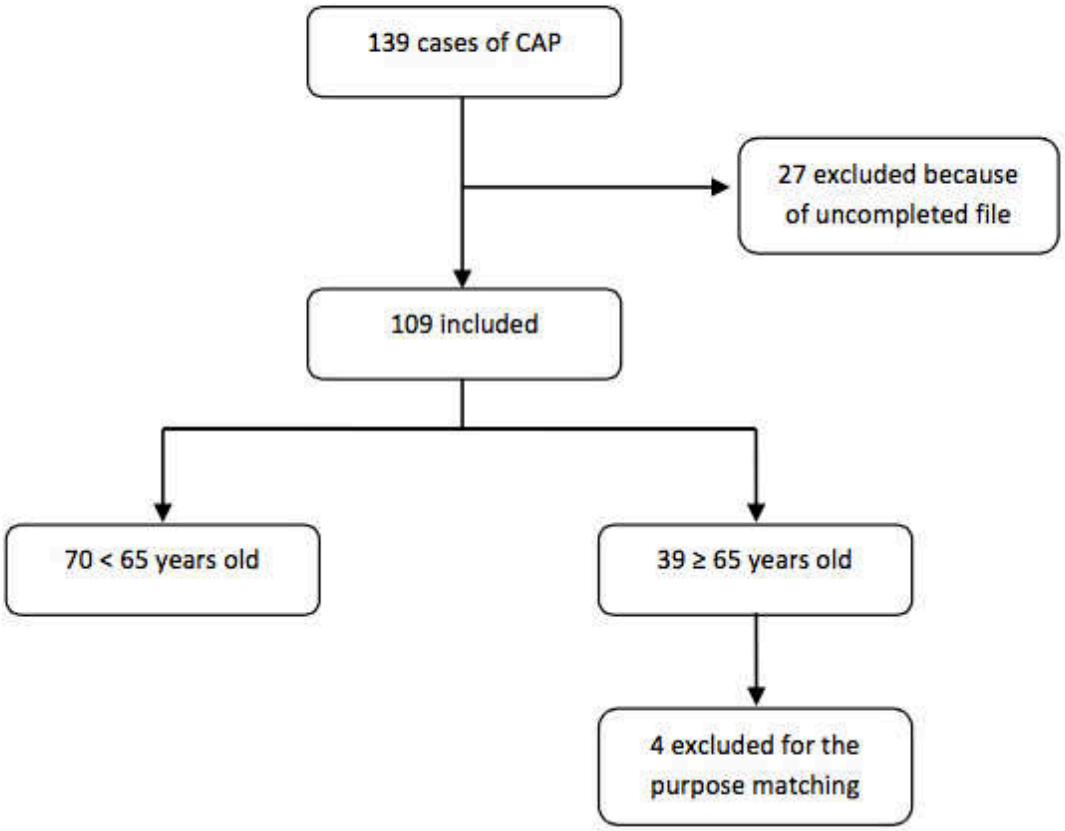

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**Table I: Distribution according to clinical signs**

| Clinical signs | ≥ 65 years old n (%) | < 65 years old n (%) | p |
|---|---|---|---|
| Cough | 27 (77%) | 63 (90%) | 0.04 |
| Sputum | 11 (11%) | 36 (52%) | 0,02 |
| Fever | 18 (51%) | 66 (94%) | 0,02 |
| Dyspnea | 23 (66%) | 24 (34%) | NS |
| Chest pain | 9 (26%) | 19 (27%) | NS |
| Infectious of upper airways | 6 (17%) | 9 (13%) | NS |
| Auscultatory abnormalities | 27 (77%) | 52 (74%) | NS |

**NS :** none significant

**Table II: Distribution according to paraclinical signs**

| | ≥ 65 years old n (%) | < 65 years old n (%) | p |
|---|---|---|---|
| Leukocyte | | | |
| - Leukopenia ≤4000/ml | 11 (33%) | 6 (9%) | 0,03 |
| - Hyper leukocytosis≥20000 / ml | 0 | 7 (10) | |
| CRP Rates | | | |
| - Normal | 19 (54%) | 2 (3%) | 0,001 |
| - High | 16 (46%) | 68 (97%) | |
| Hyponatremia <130mmol/L | | | |
| - Yes | 9 (26%) | 15 (15%) | 0,62 |
| - No | 26 (74%) | 55 (75%) | |

**Table III. Distribution of signs of seriousness**

| Signs of severity | ≥ 65 years old n (%) | < 65 years old n (%) | p |
|---|---|---|---|
| Alteration of consciousness | 8 (23%) | 4 (6%) | 0,03 |
| Systolic blood pressure ≤90 mm Hg | 17 (49%) | 13 (19%) | 0,03 |
| Cardiac rhythm ≥120/min | 5 (14%) | 9 (13%) | NS |
| Respiratory rate ≥30/min | 21 (60%) | 30 (41%) | NS |
| Temperature ≥40°C or ≤35°C | 14 (40%) | 22 (31%) | NS |
| Aspiration pneumonia | 2 (6%) | 4 (6%) | NS |
| Multilobar pneumonia | 12 (32%) | 10 (14%) | NS |
| Bilateral pulmonary involvement | 5 (14%) | 8 (11%) | NS |

C: Celsius, NS : none significant

**Table IV: Distribution according to comorbidity associated**

| Comorbidity associated of CAP | ≥ 65 years old n (%) | < 65 years old n (%) | p |
|---|---|---|---|
| Cerebrovascular disease | 3 (9%) | 1 (1%) | 0,2 |
| Congestive heart failure | 7 (20%) | 5 (7%) | 1 |
| Renal failure | 21 (60%) | 16 (23%) | 0,1 |
| Respiratory disease | 5 (14%) | 3 (4%) | 0,15 |
| Diabetes | 3 (9%) | 4 (6%) | 0,15 |
| Liver disease | 1 (3%) | 1 (1%) | 1 |

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**Table V: Distribution according to the evolution of the disease**

| | 65 years old n (%) | < 65 years old n (%) | p | RR | CI (95%) |
|---|---|---|---|---|---|
| Presentation | | | | | |
| - Serious | 28 (80%) | 43 (61%) | 0,04 | 1,92 | 0,93-3,94 |
| - Simple | 7 (20%) | 27 (39%) | 0,04 | 0,52 | 0,25-1,07 |
| Therapeutic response after 72 hours | | | | | |
| - Favorable | 20 (57%) | 56 (80%) | 0,01 | 0,33 | 0,12-0,89 |
| - unfavorable | 15 (43%) | 14 (20%) | 0,01 | 3 | 1,13-8,05 |
| Disease outbreak | | | | | |
| - healing | 26 (74%) | 67 (96%) | 0,001 | 0,13 | 0,13-0,58 |
| - death | 9 (26%) | 3 (5%) | 0,001 | 2,68 | 1,69-4,26 |
| Duration of hospitalization | | | | | |
| - <10 days | 15 (41%) | 52 (75%) | 0,001 | | |
| - ≥10 days | 20 (59%) | 18 (25%) | 0,001 | | |

RR: relative risk, CI: confidence interval

## References

1. Orincil R. Community-acquired acute pneumonitis observed in the unit of Pneumophtisiology of CHU Mahajanga [Thesis]. Human Medicine: Mahajanga; 2011.117p.

2. Elkharrat D, Debatisse A, Benhamou F, Le Corre A. Simplified management of acute community-acquired pneumonia in emergencies. Emergency Medicine. [Online] 2002 July. [See the 6 May 2015] [8 pages].

3. Mounedji A, Roche N, Rabbat A and Huchon G. Adult low respiratory community infections (excluding immunosuppression). EncyclMédChir (Editions Scientifiques et Médicales Elsevier SAS, Paris, all rights reserved), Pneumology, 6-003-D-10, 2002, 22 p.

4. Brisou P, Pierre C, Muzellec Y and Menard G. Pneumococcal infections. EncyclMédChir (Editions Scientifiques et Médicales Elsevier SAS, Paris, all rights reserved), Infectious Diseases, 8-012-A-10, 2003, 13 p.

5. Eléonore M. Diagnosis and treatment of acute community-acquired pneumonia in immunocompetent adults: A survey of the knowledge and practices of general practitioners in Paris [Thesis]. Human Medicine: Paris; 2013.75p.

6. Nicole C. Impact of a protocol for the observation of acute community-acquired pneumonia in hospitals: About 144 patients hospitalized at the CH of Saint Gaudens [Thesis]. Human Medicine: Toulouse; 2007.74p.

7. Caroline B wife AUVRAY. Management of community-acquired acute pneumonia in a hospital, Paris: retrospective study of 58 cases of hospitalized patients and comparison of medical practices with recommendations of ANAES 2001 [Thesis]. Human Medicine: Paris; 2006.116p.

8. E. Rupee. Adult Lung Diseases. In: SFAR, ed. Emergency Medicine. CAEN: Elsevier Masson; 2006. p. 531-40.