

## RELATIONSHIP BETWEEN ELDERLY AGE FACTORS AND COMMUNITY PNEUMONIA INCIDENCE IN LOCAL HOSPITAL

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### Abstrak

Pneumonia adalah salah satu jenis infeksi yang menyerang paru-paru. Frekuensi infeksi paru lebih besar pada individu yang lebih tua. Hal ini disebabkan oleh perubahan anatomi, fisiologi, dan sistem kekebalan tubuh lansia, yang merupakan faktor risiko yang signifikan untuk infeksi paru yang didapat dari komunitas. Usia merupakan penentu utama dari beberapa penyakit. Hal ini karena usia seseorang mencerminkan status kesehatannya. Tujuan dari penelitian ini adalah untuk mengetahui hubungan lanjut usia dengan kejadian infeksi paru. Desain observasi analitik cross-sectional dengan pengambilan sampel konsekutif digunakan dalam penelitian ini, dan diperoleh 200 rekam medis pasien sebagai sampel. Kelompok lanjut usia (60–74 tahun) memiliki jumlah penderita infeksi yang didapat masyarakat terbanyak yaitu 104 pasien (66,2%). Ada hubungan yang bermakna secara statistik antara lanjut usia dengan kejadian infeksi paru ( $p$  value = 0,035).

**Kata kunci:** Pneumonia, Lanjut Usia, Infeksi Paru Pada Lanjut Usia

### Abstract

Pneumonia is a type of infection that attacks the lungs. The frequency of pulmonary infections is greater in older individuals. This is caused by changes in the anatomy, physiology, and immune system of the elderly, which are significant risk factors for community-acquired lung infections. Age is a major determinant of several diseases. This is because a person's age reflects his health status. The purpose of this study was to determine the relationship between old age and the incidence of lung infections. A cross-sectional analytic observation design with consecutive sampling was used in this study, and 200 patient medical records were obtained as a sample. The elderly group (60–74 years) had the highest number of people with community-acquired infections, namely 104 patients (66.2%). There is a statistically significant relationship between old age and the incidence of lung infections ( $p$  value = 0.035).

**Keywords:** Pneumonia, Elderly, Lung Infection in Elderly

### INTRODUCTION

Pneumonia is a wide-ranging condition that involves an infection in the lungs resulting from various causes. It is characterized by an inflammation that affects the lung parenchyma, respiratory tract, bronchioles, and alveoli, leading to the consolidation of lung tissue and impaired gas exchange in the affected area. In Indonesia, the incidence of respiratory infections rises with advancing age, with a 5.4% increase in the 45-54 age group, 6.2% in the 55-64 age group, 7.7% in the 65-74 age group, and 7.8% in those aged over 75 years. As per the 2018 basic health research, the diagnosis of lung infections by healthcare professionals revealed an upsurge in most provinces of Indonesia across all age groups. In the province in 2013, the prevalence of infection was around 1.5%, while in 2018, the results were around 1.4%. The data for the province illustrates a decrease in the incidence of infection in that area (Baik et al., 2000).

A respiratory tract infection known as lung infection is linked to significant morbidity and death, particularly in children in underdeveloped nations. The incidence of infection is higher in the elderly; this is due to changes in anatomy, physiology, and the immune system in the elderly, which are important risk factors for community pneumonia (Bilal et al., 2012). Physiological changes in the lungs are caused by the aging process, which causes a decrease in lung elasticity, a decrease in chest expansion, and a decrease in the strength of the chest cavity muscles. During the aging process, there are also changes in immunity, namely a decrease in immune cells. These changes can facilitate the occurrence of infections in the lungs (Setiati et al., 2014). Community transmission is a combination of two terms, infection and community. Infection refers to an inflammatory condition that impacts the lung parenchyma, respiratory tract, bronchioles, and alveoli, leading to lung tissue consolidation and

compromised local gas exchange (Maryam, 2008). Pneumonia, in clinical terms, is characterized as a lung inflammation caused by microorganisms such as bacteria, viruses, fungi, and parasites. According to KBBI, a community is a group of people who live in a specific area and interact with one another. The definition of pulmonary infection itself is an infection of the lungs that starts outside the hospital or is diagnosed within 48 hours after hospital admission in patients who do not occupy long-term health facilities for 14 days or more before symptoms appear and is usually accompanied by the presence of infiltrates on chest radiology (Bansal et al., 2004).

Numerous research has also been conducted on the impact of the patient's age on pulmonary infections. It is stated that although pulmonary infection can afflict individuals of all ages, it poses the greatest danger to youngsters and senior citizens. The frequency of community-acquired pneumonia in grown-ups fluctuates between 8 and 15 occurrences per 1,000 individuals annually. The incidence of lung infection increases 2-4 times in the age group over the age of 60 years (Chong & Street, 2008). Until now, pulmonary infections were still among the top 10 diseases that required hospitalization. The main causes of lung infections are bacteria, viruses, microplasma, fungi, and various chemical compounds and particles. Lung infections can occur at any age, but the worst clinical manifestations occur in children, the elderly, and people with chronic diseases. The morbidity rate of lung infections in toddlers is 3%, while the mortality rate in toddlers is 15.5%. At the age of 65–74 years, the average incidence rate (IR) of lung infection is 10 per 1000 population; at the age of 75–84 years, it is 16.9 per 1000 population; and at the age of 85 years or more, the IR is 29.4 per 1000 population.

Lung infections can occur in normal people without obvious immune disorders. However, in most adult patients who suffer from lung infections, one or more basic diseases are found that interfere with the immune system (Efendi & Makhfudli, 2009). Lung infections are increasingly common in the elderly and are common in chronic obstructive pulmonary disease (COPD). It may also arise in patients with additional ailments like DM, cardiac insufficiency, coronary artery disease, malignancy, renal malfunction, persistent neurological disorders, and chronic liver ailments. Additional factors that may make one more susceptible include tobacco use, post-viral infections, DM, immunodeficiency ailments, structural anomalies or weaknesses of the chest organs, and reduced consciousness (Farr et al., 2000). Prior research has also discovered diverse risk factors for each gender. For instance, obesity and insufficient physical activity heighten the risk for women but not for men. Meanwhile, men are at greater risk if they have a history of smoking or are older, while women are at greater risk if they are passive smokers (Kumar et al., 2013).

Age is a major risk factor for several diseases. This is because age shows a person's health condition. Aging (getting old) is a condition that occurs in human life. The elderly are the final stage of the development process in the human life cycle (Malik & Khan, 2012). An individual whose age has reached more than 60 years can be said to be elderly. The elderly are closely related to various changes due to the aging process, such as changes in anatomy, physiology, and the immune system, which, when accompanied by psychosocial influences, will have an impact on changing the clinical picture of these patients compared to other age groups. The changes that occur in the elderly will result in a decrease in health status (Marie & Wu, 2005).

## METHOD

The methodology employed in this investigation was analytical-observational and utilized a cross-sectional research design. The target population consisted of aged patients who were either admitted or were outpatients at the hospital. The sample population was comprised of elderly patients who were either admitted or were outpatients, whose medical records were documented in 2019, and were selected as per the inclusion criteria. The sampling method utilized in this study was non-probability sampling through consecutive sampling. Data collection was sourced from secondary data, specifically medical records of elderly patients. The data processing phases entailed cleaning, editing, coding, and entry. The examination employed in this study encompassed univariate analysis, bivariate analysis, and multivariate analysis. The data presentation was performed using narrative, text, and tables.

## RESULTS AND DISCUSSION

This research was conducted by collecting secondary data on elderly patients over 60 years old at the Regional General Hospital. The medical record data used were for elderly patients with lung infections, elderly patients with ARI, and elderly patients with asthma who were inpatients and

outpatients at the hospital from January to December 2019. Sampling was carried out using the consecutive sampling method from Of the 179 data points provided by the Medical Record Team, 200 patients were found to meet the established inclusion criteria, with details of 132 inpatients and 55 outpatients, and 13 patients were not included because they had one or more of the established exclusion criteria. Regarding the allocation of aged patients with respiratory infections based on age categories, 66% were categorized as elderly individuals (60-74 years old) and 34% were classified as old elderly individuals (75-90 years old). The investigation of the correlation between the elderly population and the prevalence of lung infections revealed that 92% of elderly patients aged 61-74 years old had pulmonary infections, compared to 100% of elderly patients aged 75-90 years old who had lung infections. The statistical examination illustrated that there was a noteworthy association between advanced age and the incidence of lung infections ( $p$  value =  $0.035 < 0.05$ ). The outcome of the regression test indicated that there was a significant relationship between the elderly population and the prevalence of lung infections, as evidenced by the  $p$  value being less than 0.05.

The results showed that the distribution of elderly patients with lung infections based on age group found in the elderly group (60–74 years) as many as 66%, and in the elderly group (75–90 years) as many as 34%. The findings of this investigation were nearly identical to those of prior studies: the age bracket (60–69 years) had 57%, the age bracket (70–79 years) had 35%, and the age bracket (80–89 years) had 8%. Additionally, the outcomes of this research align with those of earlier studies, which discovered that 78% of the elderly group (60-74 years) were affected, as were 21% of the elderly group (75-90 years) and 1% of the very old elderly group (>90 years). Similar results were also obtained in previous research, which found that in the 65-74-year-old age bracket, 64% were affected, while in the 75-84-year-old age bracket, 28% were affected, and in the age bracket over 85 years, 8% were affected. In a study conducted by Riquelme et al., they discovered that 30.3% were aged 65-74 years, 41.8% were aged 75-84 years, and 27.8% were >85 years. In another study by Torres et al., the average age of elderly patients with lung infections was  $78 \pm 8$  years. The variation in the rise in the morbidity rate of community pneumonia patients in the elderly group may be due to differences in the population studied, which are closely linked to the access of these patients to health care centers or hospitals.

The increasing incidence of lung infections in the elderly is due to the fact that the older the patient, the lower the body's resistance to disease; the elasticity of the lungs will decrease, there will be a decrease in respiratory muscle strength, which causes the effectiveness of coughing to also decrease; and mucociliary clearance disturbances will occur as well as the cumulative effect of the disease. patient's chronic comorbidities. In a study conducted in 2020 on senior citizens, the findings revealed a noteworthy correlation between advanced age and the prevalence of respiratory infections, with a  $p$ -value of 0.035. This investigation corroborates prior research that identified a significant association between age and respiratory infections in individuals aged  $\geq 70$  ( $p$ -value = 0.001). A separate research conducted in England reported that the odds ratio escalated to 1.6 (95% CI: 1.01-2.53) in the 40-59 age group and surged to 2.85 (95% CI: 1.83-4.45) in the > 60 years age group. However, in contrast to previous studies, it was found that age  $\geq 65$  years was not proven to increase the risk of death in lung infections ( $p$  value = 0.40); this difference could be due to the greater proportion of patients aged less than 65 years (64.1%). The increased risk and incidence of lung infections in the elderly are associated with several risk factors and comorbidities. However, decreased immunity or lung function can also occur in elderly people, even if there are no comorbid factors. In the elderly, the mucociliary mechanism of the airway has been shown to be less efficient. Aging has a decreasing effect on various host protection mechanisms in the lung, including barrier mechanics, phagocytic activity, humoral immunity, and T cells. Other specific changes include the decreased function of antigen-specific peripheral B and T cells. Aging also affects the functions of natural killer (NK) cells, macrophages, and neutrophils, as well as the capacity to swallow and the cough reflex.

## CONCLUSION

The allocation of aged individuals afflicted with respiratory ailments in medical facilities, according to the topmost age bracket, was dominated by the older population (60-74 years) with 104 cases, followed by the elderly population (75-90 years) with 53 cases. A correlation exists between advanced age and the occurrence of lung infections ( $p$  value = 0.035). For further studies to analyze other risk factors that have not been studied, such as gender, occupation, BMI (Body Mass Index), and

comorbidities, to see the relationship with the incidence of lung infections in the elderly. Writing medical records should be done in full, especially to see the most frequent symptoms in patients.

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