

The Epidemiology of Hospitalized Pneumonia in Bahteramas Hospital, Southeast Sulawesi Province

Ramadhan Tosepu¹, Yusnaniningsi Yusnaniningsi²
{ramadhan.tosepu@uho.ac.id¹, nanymakka33@gmail.com²}

¹ Faculty of Public Health, Halu Oleo University, Kendari, Indonesia

² The Postgraduate program, Halu Oleo University, Indonesia and Rumah Sakit Umum Daerah Bahteramas, Sulawesi Tenggara, Indonesia

Abstract. Pneumonia is a disease that can affect all age groups. In some countries, this disease is often found in groups of children. Various causes of pneumonia such as microorganisms. This study was conducted at the Bahteramas Hospital in Southeast Sulawesi Province; the data taken was patients treated with symptoms of pneumonia in the period 2012-2017. It was concluded that the sex group of male patients was higher than women and from the age group of patients with age less than four years.

Keywords: Pneumonia, Ages, Gender, Indonesia.

1. Introduction

Pneumonia is an infectious disease that is often found in the lungs caused by microorganisms (bacteria, viruses, fungi, or parasites) [1]. Clinically, pneumonia is divided into community pneumonia or what is also called pneumonia acquired is pneumonia obtained outside of the hospital [2],[3]. The bacteria that cause pneumonia include *S. pneumoniae*, *H. Influenza*, Gram-negative *Basilus*, *M. pneumoniae*, *C. pneumoniae*, *L. pneumonia* [4],[5]. While pneumonia that occurs in hospitals is called nosocomial pneumonia, namely pneumonia during hospital treatment, especially in the elderly, after surgery and on ventilator use [6],[7]. Some causes of nosocomial pneumonia are the gastric aspiration, thoracic aspiration, use of type II histamine inhibitors, use of nebulizers, humidifiers, nasogastric pipes, endotracheal pipes, and enteral feeding through all of these causes are risk factors for infection nosocomial in the lungs [8],[9],[10].

Globally *Streptococcus pneumoniae* is the most common pathogenic bacterium in humans causing pneumonia, pneumococcus is considered as one of 9 bacteria that cause international concerns published by the World Health Organization in 2014 [11],[12]. Whereas in old age it is caused by gram-negative aerobes, such as *S. Aereus* [13].

The description and analysis of the situation of pneumonia at Bahteramas Hospital represent the incidence of pneumonia which also occurs in Indonesia and even in the world. To increase awareness about the dangers of pneumonia, November 12 is celebrated as the world pneumonia day. Pneumonia is the single largest cause of infection in children worldwide. Pneumonia killed 920,136 children under the age of 5 in 2015, accounting for 16% of all deaths of children under the age of five. Pneumonia attacks children and families everywhere but is most common in South Asia and sub-Saharan Africa [14].

The estimated percentage of pneumonia cases in infants under the Province in Indonesia is 3.55%, and Southeast Sulawesi province is 3.84% [15], and case fatality rate pneumonia in toddlers by province and age group in 2016 in Southeast Sulawesi province with cases of

people aged <1 year at 36.57% and ages 1-4 years at 63.42% [15]. The number of pneumonia cases in children under five by province and age group in 2017 in Southeast Sulawesi Province with cases of people aged <1 year at 37.60% and ages 1-4 years at 62.39% [15]. The purpose of this study was to describe pneumonia cases based on gender, and age treated in Bahteramas hospital, southeast Sulawesi province.

2. Methods

We reviewed records of pneumonia admitted to Bahteramas hospital from 2012 to 2017. Data on pneumonia in all patients with a diagnosis consistent with pneumonia included the following terms: acute respiratory infection, pneumonia, aspiration pneumonia, bronchopneumonia, lobar pneumonia, chest infection, acute chest infection, respiratory infections, and lower respiratory tract infections. Data is presented in a graph based on Cases of pneumonia, gender, and Ages

3. Results

Diagnosis of pneumonia in the hospital is based on clinical considerations supported by radiology, sputum examination and blood tests of 20-30% show a positive culture. Patient data caused by pneumonia hospitalized in Bahteramas General Hospital were seen to continue to increase, in 2012 a total of 366 cases, and decreased in 2013 with a total of 299 cases, but in 2014 until 2017 it was seen to increase with a total of 696 cases in 2017, (Figure 1).

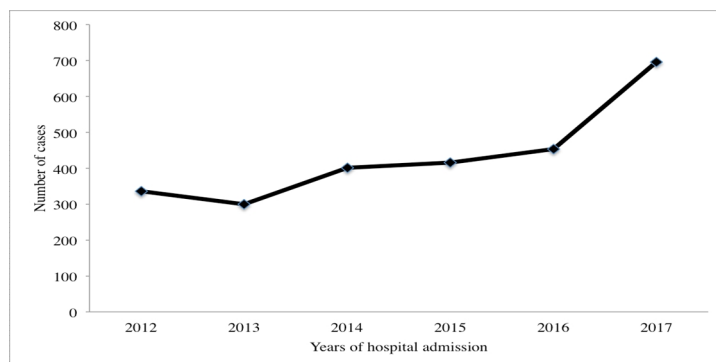


Figure 1. Number of pneumonia cases by years of hospital admission.

Patients with pneumonia who were hospitalized according to gender also described an increase in the incidence of pneumonia each year. The proportion of pneumonia incidence in male and female patients is different where it is clear that male sufferers are higher than the percentage of female sufferers. In figure 2, there are fluctuating cases in both male and female patients. However, male sufferers continue to increase until 2017 reaches a rate of (60%), whereas in 2012 the number of male patients hospitalized with pneumonia was (55%) and women (44%), in in 2013 men (54%) and women (45%), 2014 men (53%) and women (46%), 2015 men (53%) women (46%) and 2016 men men (58%) and women (41%), (Figure 2).

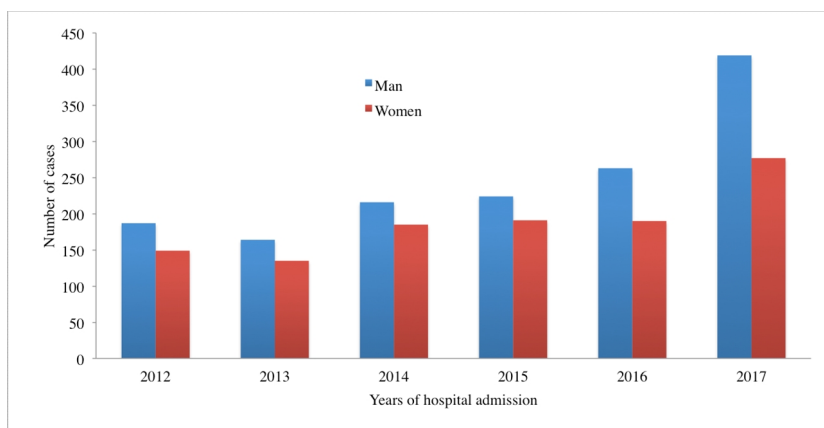


Figure 2. Cases of pneumonia by gender in Bahteramas Hospital, Southeast Sulawesi Province

Pneumonia attacks all ages in all regions, but most are in South Asia and sub-Saharan Africa [16]. Populations prone to pneumonia are children less than two years old. Based on data from the Bahteramas Hospital Proportion of pneumonia in the age group, it appears that the proportion of pneumonia in infants (<1 year) from 2012 - 2017 totaled 21% - 43% of the total cases of all age groups and toddlers (1-4 years) and years 2012 - 2017 total cases of 20% - 30% of the total cases of all age groups, this shows that pneumonia in infants and toddlers is a high enough case (Figure.3). When compared with other age groups. This shows that infants and toddlers are the age group with the highest pneumonia cases in Bahteramas hospital. Therefore pneumonia in infants and especially in infants needs attention.

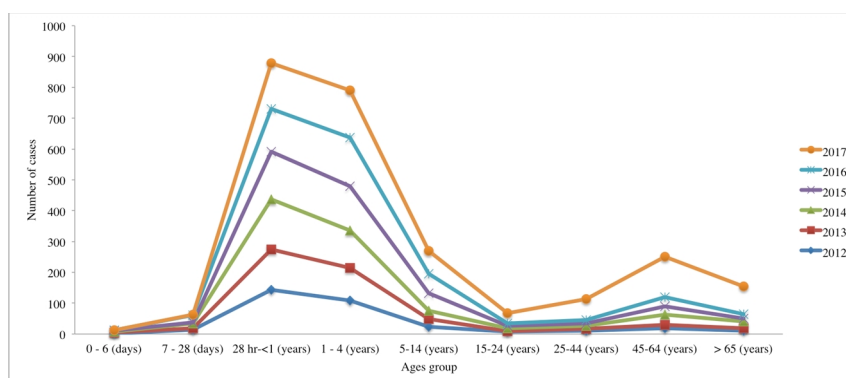


Figure 3. Cases of pneumonia by age in Bahteramas Hospital, Southeast Sulawesi Province

4. Discussion

In general, pneumonia can affect everyone, but there are two age groups that have the highest risk in this case infants or children and adults over 65 years, the picture above shows the frequency of pneumonia sufferers in the Bahteramas Hospital continues to increase every year. When looking at microorganisms that cause community pneumonia, in general, are bacteria from the gram-positive group. Comorbid factors, such as a history of alcoholism, and

smoking and the location of treatment can affect microorganisms that cause community pneumonia [17]. Most community pneumonia patients have at least one comorbid disease. Heart disease and Diabetes Mellitus are the most comorbidities found [18]. States that more than half of elderly patients were diagnosed with community pneumonia and heart disease.

The most common clinical symptoms are shortness of breath, coughing, and fever, shortness of breath, coughing, and fever are clinical symptoms that often appear. The clinical sign that often appears in the study sample is the sound of wet cracks, followed by bronchial lung sounds [19]. Nosocomial pneumonia is often masked by a pulmonary embolism, intoxication, and allergies, and cardiac decompensation, the largest bacterium for nosocomial pneumonia is an-aerobic bacteria [20].

In pneumonia sufferers male sex looks high compared to women, if the child is caused the respiratory tract diameter of boys is smaller than girls or there is a difference in the resistance of boys and girls [21, 22]. Whereas in adulthood, male sufferers are high; this may be influenced by smoking habits and the existence of differences such as economic and social conditions, demographic factors and lifestyle [23].

The frequency of pneumonia sufferers by age group, in infants and children under the age of two years the risk of getting pneumonia is higher, this can be caused because the immune system is still in the development stage. Another thing that causes pneumonia is environmental factors such as cigarette smoke, toddlers who have members of the family of smokers at risk of 10.3 times suffering from pneumonia, in addition to age, socio-economic factors and exclusive breastfeeding also influence as additional variables [24],[25],[26].

Seeing the incidence of pneumonia is quite high and tends to increase every year, so it is necessary to try preventive or suppressive measures so that there is no increase in the incidence and mortality caused by pneumonia. To improve pneumonia control and surveillance one of the efforts of the Ministry of Health by establishing ten provinces as sentinel pneumonia areas in 2007, then it will be developed into 20 provinces in 2010 and is expected to become 33 provinces in 2014 [27],[28].

5. Conclusion

The incidence of pneumonia in Bahtermas Hospital is quite high, from the sex group of male patients is higher than women, and from the age group of patients with age less than four years is also high, this is caused by several factors including environmental factors that are not healthy as exposure to cigarette smoke.

Reference

- [1] C. P. Thomas, M. Ryan, J. D. Chapman, W. B. Stason, C. P. Tompkins, J. A. Suaya, et al., "Incidence and Cost of Pneumonia in Medicare Beneficiaries," *Chest*, vol. 142, pp. 973-981, 2012/10/01/, 2012.
- [2] J. de Miguel-Díez, R. Jiménez-García, V. Hernández-Barrera, I. Jiménez-Trujillo, J. M. de Miguel-Yanes, M. Méndez-Bailón, et al., "Trends in hospitalizations for community-acquired pneumonia in Spain: 2004 to 2013," *European Journal of Internal Medicine*, vol. 40, pp. 64-71, 2017/05/01/, 2017.
- [3] A. Agweyu, R. J. Lilford, and M. English, "Appropriateness of clinical severity classification of new WHO childhood pneumonia guidance: a multi-hospital, retrospective, cohort study," *The Lancet Global Health*, vol. 6, pp. e74-e83, 2018/01/01/.

- 2018.
- [4] J. Hoskins, W. E. Alborn, J. Arnold, L. C. Blaszczak, S. Burgett, B. S. DeHoff, et al., "Genome of the bacterium *Streptococcus pneumoniae* strain R6," *Journal of bacteriology*, vol. 183, pp. 5709-5717, 2001.
 - [5] J. Blanquer, R. Blanquer, R. Borrás, D. Nauffal, P. Morales, R. Menéndez, et al., "Aetiology of community acquired pneumonia in Valencia, Spain: a multicentre prospective study," *Thorax*, vol. 46, pp. 508-511, 1991.
 - [6] B. H. Hayes, D. L. Haberling, J. L. Kennedy, J. K. Varma, A. M. Fry, and N. M. Vora, "Burden of Pneumonia-Associated Hospitalizations: United States, 2001-2014," *Chest*, vol. 153, pp. 427-437, 2018/02/01/, 2018.
 - [7] D. Baker and B. Quinn, "Hospital Acquired Pneumonia Prevention Initiative-2: Incidence of nonventilator hospital-acquired pneumonia in the United States," *American Journal of Infection Control*, vol. 46, pp. 2-7, 2018/01/01/, 2018.
 - [8] M. Sogaard, R. B. Nielsen, H. C. Schönheyder, M. Nørgaard, and R. W. Thomsen, "Nationwide trends in pneumonia hospitalization rates and mortality, Denmark 1997–2011," *Respiratory Medicine*, vol. 108, pp. 1214-1222, 2014/08/01/, 2014.
 - [9] S. Jain, "Epidemiology of Viral Pneumonia," *Clinics in Chest Medicine*, vol. 38, pp. 1-9, 2017/03/01/, 2017.
 - [10] R. E. Corrado, D. Lee, D. E. Lucero, J. K. Varma, and N. M. Vora, "Burden of Adult Community-acquired, Health-care-Associated, Hospital-Acquired, and Ventilator-Associated Pneumonia: New York City, 2010 to 2014," *Chest*, vol. 152, pp. 930-942, 2017/11/01/, 2017.
 - [11] L. Kang, C. He, L. Miao, J. Liang, J. Zhu, X. Li, et al., "Geographic disparities in pneumonia-specific under-five mortality rates in Mainland China from 1996 to 2015: a population-based study," *International Journal of Infectious Diseases*, vol. 59, pp. 7-13, 2017/06/01/, 2017.
 - [12] C. Cilloniz, I. Martin-Loeches, C. Garcia-Vidal, A. San Jose, and A. Torres, "Microbial etiology of pneumonia: epidemiology, diagnosis and resistance patterns," *International journal of molecular sciences*, vol. 17, p. 2120, 2016.
 - [13] R. Widyaningsih and L. Buntaran, "Pola Kuman Penyebab Ventilator Associated Pneumonia (VAP) dan Sensitivitas Terhadap Antibiotik di RSAB Harapan Kita," *Sari Pediatri*, vol. 13, pp. 384-90, 2016.
 - [14] W. H. Organization, "Antimicrobial resistance global report on surveillance: 2014 summary," World Health Organization, 2014.
 - [15] R. Kementerian Kesehatan, "Data dan Informasi Profil Kesehatan Indonesia Tahun 2016," Jakarta: Pusat Data dan Informasi Kemenkes RI, 2017.
 - [16] A. F. Putri, "Hubungan Antara Keberadaan Anggota Keluarga Yang Merokok Dengan Kejadian Pneumonia Pada Anak Usia 1-4 Tahun Di Wilayah Kerja Puskesmas Tawang Sari Sukoharjo," Universitas Muhammadiyah Surakarta, 2017.
 - [17] L. A. Mandell, R. G. Wunderink, A. Anzueto, J. G. Bartlett, G. D. Campbell, N. C. Dean, et al., "Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults," *Clinical infectious diseases*, vol. 44, pp. S27-S72, 2007.
 - [18] A. M. Fry, D. K. Shay, R. C. Holman, A. T. Curns, and L. J. Anderson, "Trends in hospitalizations for pneumonia among persons aged 65 years or older in the United States, 1988-2002," *Jama*, vol. 294, pp. 2712-2719, 2005.
 - [19] A. Gozali, "Hubungan antara status gizi dengan klasifikasi pneumonia pada balita di puskesmas Gilingan kecamatan Banjarsari Surakarta," UNS, 2010.

- [20] A. Anwar and I. Dharmayanti, "Pneumonia pada anak balita di Indonesia," *Kesmas: National Public Health Journal*, vol. 8, pp. 359-365, 2014.
- [21] S. Azmi, S. M. Aljunid, N. Maimaiti, A.-A. Ali, A. Muhammad Nur, M. De Rosas-Valera, et al., "Assessing the burden of pneumonia using administrative data from Malaysia, Indonesia, and the Philippines," *International Journal of Infectious Diseases*, vol. 49, pp. 87-93.
- [22] S. Hartati, N. Nurhaeni, and D. Gayatri, "Faktor risiko terjadinya pneumonia pada anak balita," *Jurnal Keperawatan Indonesia*, vol. 15, pp. 13-20, 2012.
- [23] T.-L. Lauderdale, F.-Y. Chang, R.-J. Ben, H.-C. Yin, Y.-H. Ni, J.-W. Tsai, et al., "Etiology of community acquired pneumonia among adult patients requiring hospitalization in Taiwan," *Respiratory medicine*, vol. 99, pp. 1079-1086, 2005.
- [24] S. Y. M. Hadiana, "Hubungan Status Gizi Terhadap Terjadinya Infeksi Saluran Pernapasan Akut (ISPA) Pada Balita Di Puskesmas Pajang Surakarta," Universitas Muhammadiyah Surakarta, 2013.
- [25] T. A. Yuwono, "Faktor-Faktor Lingkungan Fisik Rumah Yang Berhubungan Dengan Kejadian Pneumonia Pada Anak Balita Di Wilayah Kerja Puskesmas Kawunganten Kabupaten Cilacap," Program Pasca Sarjana Universitas Diponegoro, 2008.
- [26] M. Nurnajiah, R. Rusdi, and D. Desmawati, "Hubungan Status Gizi dengan Derajat Pneumonia pada Balita di RS. Dr. M. Djamil Padang," *Jurnal Kesehatan Andalas*, vol. 5, 2016.
- [27] R. J. Bardan, "Analisis Penerapan Keselamatan Pasien Di Rumah Sakit Umum Daerah Inche Abdoel Moeis Tahun 2017.", 2017.
- [28] L. S. Marlinawati, "Faktor-faktor yang mempengaruhi penemuan kasus pneumonia balita di Puskesmas Kota Tangerang Selatan Tahun 2015," UIN Syarif Hidayatullah Jakarta: Fakultas Kedokteran dan Ilmu Kesehatan, 2015.