ABSTRACT

Bacteria and its coinfection with virus are the two most causes of hospitalized patient with pneumonia in Indonesia. From all infection caused by bacteria, the multi-drug resistant (MDR) infection causes 700,000 deaths per year and it is estimated increasing of 10 million per year by 2050. Based on this estimation, the proportion of MDR pathogen in hospitalized patient with pneumonia is an important data in hospital antibiotic stewardship program and to define the empiric treatment based of local hospital antibiogram. Some tertiary A type national-referral hospital had reported the MDR proportion in pneumonia patients, however none of them were from non-national referral tertiary hospital in Yogyakarta. Therefore, this research analyzed the proportions of MDR pathogen and their antibiotic susceptibility pattern from hospitalized pneumonia patients in Rumah Sakit Akademik Universitas Gadjah Mada (RSA UGM), the only tertiary B type education hospital in Sleman Yogyakarta.

This study is a retrospective descriptive study in hospitalized patients with pneumonia under the International Statistical Classification of Diseases and Related Health Problems-10 (ICD-10) J15, J16, J17, J18 code during 1 May 2018 - 30 April 2021. Bacterial pathogens isolated from blood, sputum and urine of pneumonia patients were analized. Only bacterial pathogen isolates were analyzed, while non pathogen isolates and isolates without sensitivity test were excluded.

Three hundred and nineteen (319) patients were selected from 1585 hospitalized pneumonia patients. Total number of analized clinical speciments collected from 319 patients consist of 7 urine, 5 blood, and 351 sputum, resulting 489 bacterial isolates. The four most dominant bacterial pathogens were *Klebsiella pneumoniae* 122/489 (24,95%), *Staphylococcus aureus* 83/489 (19,97%), *Pseudomonas aeruginosa* 68/489 (13,91%) and *Acinetobacter baumannii* 66/489 (13,50%). Of the 489 isolates, the proportion of MDR isolate was 165/489 (33,74%), Possible XDR 51/489 (10,43%), and PDR 0%. Priority pathogens found were CRA 38/66 (57,58%), *Enterobacterales* ESBL 73/203 (34,48%), CRPA 13/68 (19,12%), MRSA 16/83 (19,28%), dan CRE 4/203 (1,97%). From those priority pathogens, CRA, CRPA and Enterobacter spp. ESBL positive were more frequently isolated from patients treated in intensive care unit and using high hazard medical devices. *S. aureus* isolates were sensitive to all antibiotics tested exept penicillin and tetracycline. In addition, *Enterococcus spp.* also sensitive to all antibiotics tested exept ciprofloxacin and tetracycline. Meanwhile, gram-negative isolates had high sensitivity level to amikacin, tigecycline and meropenem (except *A. baumannii*), but low to cephalosporin.

Nearly one third of the pathogens in hospitalized pneumonia patients are MDR. It is necessary to strengthen infection prevention and surveillance of pathogens in hospitals.

Keywords: pneumonia, hospitalized, MDR proportion, sensitivity pattern, RSA UGM

ABSTRAK

Bakteri dan koinfeksi dengan virus merupakan penyebab terbanyak pneumonia di Indonesia. Dari berbagai infeksi bakteri, infeksi oleh bakteri *multi-drug resistant* (MDR) mengakibatkan kematian sebanyak 700.000/ tahun dan diprediksi meningkat menjadi 10 juta/ tahun pada 2050. Berdasarkan hal tersebut, data tentang bakteri patogen MDR pada pasien pneumonia rawat inap penting diketahui sebagai dasar program penatagunaan antibiotik di rumah sakit dan data terapi empiris berdasar antibiogram rumah sakit lokal. Rumah Sakit Akademik UGM (RSA UGM) adalah satu-satunya rumah sakit tersier tipe B pendidikan non-rujukan nasional di Sleman Yogyakarta yang memiliki kompetensi merawat pasien rujukan rumah sakit tipe C dan D di Yogyakarta dan beberapa pusat pelayanan primer. Sampai saat ini, belum ditemukan data proporsi MDR pada pasien pneumonia dari rumah sakit tersier non rujukan nasional di Yogyakarta. Sehingga penelitian ini menganalisis distribusi dan proporsi patogen terutama MDR serta pola kepekaannya terhadap antibiotik di RSA UGM.

Penelitian ini merupakan penelitian deskriptif retrospeksif pada pasien rawat inap yang dirawat > 48 jam dengan diagnosis pneumonia kode *International Statistical Classification of Diseases and Related Health Problems-10* (ICD-10) J15, J16, J17, J18 periode 1 Mei 2018 - 30 April 2021. Peneliti akan menganalisis bakteri patogen pada pasien pneumonia selama rawat inap yang diisolasi dari spesimen darah, sputum dan urin. Hanya bakteri patogen yang dilakukan analisis, bukan isolat bakteri non patogen dan tanpa hasil uji kepekaan terhadap antibiotik.

Tiga ratus sembilan belas (319) pasien dipilih dari 1.585 pasien pneumonia yang dirawat di rumah sakit. Jumlah spesimen klinis yang dianalisis dari 319 pasien terdiri dari 7 urin, 5 darah, dan 351 sputum, dengan total 489 isolat bakteri. Empat bakteri patogen yang paling dominan adalah *Klebsiella pneumoniae* 122/489 (24,95%), *Staphylococcus aureus* 83/489 (19,97%), *Pseudomonas aeruginosa* 68/489 (13,91%) dan *Acinetobacter baumannii* 66/489 (13 ,50%). Dari 489 isolat, proporsi isolat MDR sebesar 165/489 (33,74%), *Possible* XDR 51/489 (10,43%), dan PDR 0%. Patogen prioritas yang ditemukan pada penelitian ini yaitu CRA 38/66 (57,58%), *Enterobacterales* ESBL positif 73/203 (34,48%), CRPA 13/68 (19,12%), MRSA 16/83 (19,28%), dan CRE 4/203 (1,97%). Dari patogen prioritas tersebut, CRA, CRPA dan *Enterobacter spp*. ESBL positif lebih sering diisolasi dari pasien yang dirawat di unit perawatan intensif dan menggunakan peralatan medis hazard tinggi. Isolat *S. aureus* peka terhadap semua antibiotik yang diuji kecuali penisilin dan tetrasiklin. Selain itu, *Enterococcus spp*. juga peka terhadap semua antibiotik yang diuji kecuali ciprofloxacin dan tetrasiklin. Sedangkan isolat gram negatif memiliki tingkat kepekaan yang tinggi terhadap amikasin, tigecycline dan meropenem (kecuali *A. baumannii*), namun rendah terhadap cefalosporin.

Hampir sepertiga patogen pada pasien pneumonia merupakan MDR. Perlu dilakukan penguatan pencegahan infeksi dan surveillan patogen rumah sakit.

Kata kunci: pneumonia, rawat inap, proporsi MDR, pola kepekaan, RSA UGM