

ABSTRAK

Penggunaan antibiotika yang tidak rasional dalam penanganan penyakit infeksi sering menyebabkan resistensi bakteri. Data Kemenkes menunjukkan angka kematian akibat infeksi oleh bakteri yang sudah resisten antibiotik hingga tahun 2014 mencapai 700.00 orang per tahun. Beberapa bakteri patogen memiliki kemampuan membentuk biofilm. Biofilm merupakan kumpulan mikroorganisme yang melekat di suatu permukaan dan diselubungi oleh karbohidrat ekstraseluler. Infeksi oleh bakteri patogen pembentuk biofilm lebih sulit untuk ditangani karena sel bakteri dalam biofilm memiliki ketahanan yang lebih besar dibandingkan sel-sel individunya. *Klebsiella pneumoniae* merupakan salah satu bakteri yang mampu membentuk biofilm.

Dalam periode Januari-Juni 2018, Laboratorium Mikrobiologi Klinik RSA UGM mengidentifikasi 146 isolat bakteri dari 182 sampel klinik. Berdasarkan isolat tersebut, jumlah isolat bakteri pembentuk biofilm belum diketahui. Berdasarkan keterbatasan data dan banyaknya temuan bakteri *K. pneumoniae* yang diduga membentuk biofilm, oleh karena itu, penelitian berjudul “Pola Resistensi Antibiotik terhadap Bakteri *Klebsiella pneumoniae* Penghasil Biofilm pada Pasien Rawat Inap di Rumah Sakit Akademik UGM” perlu dilakukan.

Penelitian ini bertujuan untuk mengetahui kemampuan *Klebsiella pneumoniae* penyebab infeksi di RSA UGM dalam membentuk biofilm beserta pola sensitivitasnya terhadap antibiotika. Penelitian ini merupakan penelitian observasional dengan pendekatan potong lintang. *K. pneumoniae* diisolasi dari sampel klinik penderita infeksi yang dirawat di RSA UGM. Identifikasi *K. pneumoniae* dan uji kepekaan terhadap berbagai antibiotika dilakukan di Laboratorium Mikrobiologi Klinik RSA UGM dengan mesin Vitek. Deteksi kemampuan *K. pneumoniae* membentuk biofilm dilakukan di Laboratorium Mikrobiologi FKKMK UGM dengan metode *microtiter plate biofilm assay*.

Sensitivitas *K. pneumoniae* terbanyak terdapat pada antibiotik amikacin (100%), meropenem (96,29%) dan ciprofloxacin (100%). Berdasarkan 54 isolat klinis *K. pneumoniae*, terdapat 48 (88,88%) yang memiliki kemampuan membentuk biofilm. Di antara yang mampu membentuk biofilm, 19 isolat biofilm lemah berasal dari 17 (35,41%) isolat sputum, satu (2,08%) isolat pus dan satu (2,08%) isolat darah. 17 isolat biofilm sedang berasal dari 14 (29,16%) isolat sputum, satu (2,08%) isolat pus dan satu (2,08%) isolat darah. 12 (25%) isolat biofilm kuat seluruhnya berasal dari spesimen sputum.

Kata kunci: Resistensi antibiotik, *K. pneumoniae*, biofilm

ABSTRACT

The irrational use of antibiotics for infectious diseases treatment often leads to bacterial resistance. Ministry of Health data shows the death rate due to bacterial infection that have been resistant to antibiotics until 2014 reached 700,000 people per year. Some pathogenic bacteria have the ability to form biofilms. Biofilm is a collection of microorganisms attached to a surface and enveloped by extracellular carbohydrates. Infection by bacteria biofilm-forming pathogens are more difficult to treat because of deep bacterial cells biofilms have a greater resistance than individual cells. *Klebsiella pneumoniae* is an example of biofilm-forming bacteria.

In January-June 2018 period, the Clinical Microbiology Laboratory of the UGM Academic Hospital identified 146 bacterial isolates from 182 clinical samples. Based on these isolates, the number of biofilm-forming bacterial isolates is unknown. Based on limited data and the findings of *K. pneumoniae* which are suspected to forming biofilms, therefore, it is necessary to conduct a study entitled "Patterns of Antibiotic Resistance to Biofilm Producing *Klebsiella pneumoniae* Bacteria in Inpatients of UGM Academic Hospital".

This study aims to determine the ability of *Klebsiella pneumoniae* at UGM Academic Hospital in biofilm formation and its sensitivity to antibiotics. This research is an observational study with a cross sectional approach. *K. pneumoniae* was isolated from clinical samples infection patients who are treated at UGM Academic Hospital. *K. pneumoniae* identification and test sensitivity to various antibiotics were carried out at the Clinical Microbiology Laboratory of the UGM Academic Hospital using the Vitek machine. The ability test of *K. pneumoniae* forming biofilms was carried out at the Microbiology Laboratory of FKMK UGM using microtiter plate biofilm assay method.

The highest sensitivity of *K. pneumoniae* was found in amikacin (100%), meropenem (96.29%) and ciprofloxacin (100%). Based on 54 clinical isolates of *K. pneumoniae*, there were 48 (88.88%) who had the ability to form biofilms. Among those capable of forming biofilms, 19 of them were weak biofilm isolates consisting of 17 (35.41%) sputum isolates, one (2.08%) pus isolates and one (2.08%) blood isolation. 17 moderate biofilm isolates came from 14 (29.16%) sputum isolates, one (2.08%) pus isolates and one (2.08%) blood isolates. 12 (25%) strong biofilm isolates entirely derived from sputum specimens.

Keywords: antibiomatic resistance, *K. pneumoniae*, biofilm