

# Analisis Mutasi Gen *penA* dan 23S rRNA Menggunakan SYBR Green Real Time PCR sebagai Penanda Resistensi *Neisseria Gonorrhoeae* terhadap Sefiksim dan Azitromisin = Mutation Analysis of *penA* and 23S rRNA Using SYBR Green Real Time PCR as Marker of Cefixime and Azythromycin Resistant of *Neisseria Gonorrhoeae*

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## Abstrak

Resistensi *Neisseria gonorrhoeae* terhadap antibiotika merupakan masalah global di dunia. Sulitnya pertumbuhan *N. gonorrhoeae* di laboratorium menyebabkan uji kepekaan antibiotika sulit dilakukan secara reguler. Tujuan penelitian ini untuk mendeteksi *N. gonorrhoeae* dari spesimen endoserviks dan karakterisasi mutasi gen terkait resistensi terhadap sefiksim dan azitromisin sebagai antibiotika pilihan yang direkomendasikan WHO dan Kemenkes RI. Spesimen endoserviks dari wanita pekerja seks (WPS) dilakukan pewarnaan Gram, kultur, dan uji kepekaan antibiotika. Uji molekuler SYBR green real time PCR digunakan untuk mendeteksi *N. gonorrhoeae*, mutasi gen *penA* (Ala501Val/Pro, Gly545Ser) dan 23S rRNA (A2059G, C2611T). Resistensi 9 isolat *N. gonorrhoeae* terhadap sefiksim, levofloksasin, kanamisin sebesar 11,1%, 33,3%, 77,8% secara berurutan. Tidak ditemukan resistensi terhadap azitromisin dan seftriakson. Sedangkan resistensi terhadap penisilin, tetrasiklin, dan siprofloksasin ditemukan pada semua isolat. Uji SYBR green real time PCR berhasil mendeteksi *N. gonorrhoeae* dari spesimen endoserviks dan karakterisasi mutasi gen terkait resistensi terhadap sefiksim dan azitromisin. Dibandingkan pewarnaan Gram dan kultur, uji ini meningkatkan tingkat kepositifan sebesar 27% dan 15%. Tidak ditemukan mutasi pada gen *penA* dan 23S rRNA.

.....Antimicrobial resistance in *Neisseria gonorrhoeae* is a global problem in the world. Due to *N. gonorrhoeae* is difficult to grow in the laboratory, antimicrobial susceptibility testing cannot be performed regularly. The aim of this study is to detect *N. gonorrhoeae* from endocervical specimens and to characterize gene mutations associated with cefixime and azithromycin resistance as the drugs of choice recommended by WHO and the Indonesian Ministry of Health. Endocervical specimens from female sex workers (FSW) were examined using Gram staining, culture, and susceptibility testing. Molecular SYBR green real-time PCR were used to detect *N. gonorrhoeae* and mutations in *penA* (Ala501Val/Pro, Gly545Ser) and 23S rRNA (A2059G, C2611T). Resistance of 9 isolates *N. gonorrhoeae* to cefixime, levofloxacin, kanamycin, were 11,1%, 33,3%, 77,8%, respectively. Resistance to azithromycin and ceftriaxone were not found. Whereas resistance to penicillin, tetracycline, and ciprofloxacin were found in all isolates. SYBR green real time PCR was successfully detect *N. gonorrhoeae* from endocervical specimens and characterize gene mutations associated with cefixime and azithromycin resistance. Compared to Gram and culture, this method could increase positivity rates as much as 27% and 15%. Mutation in *penA* and 23S rRNA were not found.