

# Infeksi Bakteri Cairan Asites pada Sirosis Hati : Pola Patogen, Kepekaannya Terhadap Antibiotik dan Nilai Diagnostik Lima Parameter Hematologi dalam Data Populasi Sel Alat Analisa Hematologi Otomatis = Ascitic Bacterial Infection in Liver Cirrhosis: Microbial Pattern, Antibiotic Susceptibility and Diagnostic Values of 5 Hematological Parameters in Cell Population Data Automated Hematology Analyzer

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## Abstrak

Latar Belakang: Pasien sirosis hati berisiko mengalami infeksi bakteri cairan asites melalui jalur translokasi patogen di dalam saluran cerna. Kategori infeksi bakteri cairan asites netrositik meliputi PBS dan ANKN. Baku emas pemeriksaan meliputi jumlah PMN, kultur bakteri dan DNA ribosomal RNA 16S untuk mengkaji adanya patogen bakteri pada cairan asites sirosis hati. Data populasi sel alat analisa hematologi otomatis belum optimal digunakan dan perlu dikaji dalam hal kemampuan mendeteksi infeksi bakteri cairan asites.

Tujuan: Mengetahui proporsi, pola patogen, kepekaan terhadap antibiotik pada infeksi bakteri cairan asites sirosis hati dan kemampuan diagnostik 5 parameter hematologi dalam data populasi sel alat analisa hematologi otomatis dengan baku emas jumlah PMN, kultur bakteri dan atau identifikasi adanya materi genetik bakteri dengan DNA ribosomal RNA 16S pada cairan asites.

Metode: Penelitian potong lintang pada subjek asites sirosis hati oleh sebab apapun berusia 18 tahun di 3 rumah sakit rujukan tersier di Jakarta selama 4 Januari - 30 April 2021. Variabel independen terdiri dari HFLC, IG, ANC, NESFL, Delta Ret-Hb, parameter tambahan RNL dengan baku emas jumlah PMN 250, kultur bakteri positif & atau rt-PCR DNA ribosomal RNA 16S positif dengan nilai CT 31.1 pada cairan asites netrositik.

Hasil: 93% subjek adalah sirosis hati dekompensata CPS 8. Proporsi infeksi bakteri cairan asites dengan baku emas kultur: PBS 4.1%, ANKN 10.3%, bakterasites 7.1%; kultur dan DNA ribosomal RNA 16S bakteri: PBS 7.1%, ANKN 7.1%, bakterasites 45.9%. Kultur bakteri yang tumbuh 11.2% : gram negatif 54.5%, gram positif 45.4%, tidak ditemukan bakteri anaerob & E. coli. ESBL ditemukan pada E. aerogenes & P. aeruginosa. Nilai diagnostik tunggal diperoleh pada parameter IG (sensitivitas 64.3%, spesifitas 75%), ANC (64.2%, 70.2%) dan RNL (71.4%, 71.4%). Nilai diagnostik gabungan memberikan hasil terbaik pada IG, HFLC, NESFL dengan AUC 0.80 IK 95% 0.68 – 0.92 p <0.001, sensitivitas 66%, spesifitas 84%, yang berasosiasi negatif dengan infeksi bakteri cairan asites netrositik dan menghasilkan sistem skor dengan nilai AUC, sensitivitas dan spesifitas yang sama.

Simpulan: Hasil kultur & DNA bakteri memberikan proporsi infeksi bakteri cairan asites (PBS, ANKN, bakterasites) 60.1% dengan bakteri gram positif & negatif yang hampir seimbang. Ditemukan resistensi ESBL. IG, ANC & RNL memiliki nilai diagnostik tunggal. IG, HFLC dan NESFL memiliki nilai diagnostik gabungan serta menghasilkan sistem skor untuk infeksi bakteri cairan asites netrositik (PBS, ANKN).

.....ackground: Liver cirrhosis possesses risks to sustain ascitic bacterial infection in peritoneal cavity through GI tract pathogen translocation. Neutrocytic ascites bacterial infection includes SBP & CNNA.

Diagnostic gold standards for them are ascitic fluid PMN count, bacterial culture and 16S RNA Ribosomal DNA. Cell population data of automated hematology analyzer is not widely used nor evaluated as part of diagnostic process in ascitic bacterial infection.

Objective: To determine proportion, microbial pattern, antibiotic susceptibility, diagnostic values of 5 hematological parameters in cell population data of automated hematology analyzer toward gold standard of ascitic fluid bacterial infection : PMN count, bacterial culture positivity and or positivity identification of 16S RNA ribosomal DNA in liver cirrhosis ascitic fluid .

Methods: Cross sectional study of ascitic liver cirrhosis due to any cause in 18 years old subject conducted in 3 tertiary referral hospitals in Jakarta during 4 January to 30 April 2021. Independent variables consist of HFLC, IG, ANC, NESFL, Delta Ret-Hb with gold standard ascitic fluid of PMN count 250, bacterial culture positivity and or rt-PCR 16S RNA Ribosomal DNA positivity with CT value 31.1 in neutrocytic ascitic fluid.

Results: There are 93% decompensated liver cirrhosis whose CP 8. Proportion according to culture: SBP 4.1%, CNNA 10.3%, bacterascites 7.1%, while culture and or 16S ribosomal DNA : SBP 7.1%, CNNA 7.1%, bacterascites 45.9%. Proportion of 11.2% positive bacterial culture consists of gram negative 54.5%, gram positive 45.4% & none of anaerobic bacteria nor E. coli. ESBL is detected in E. aerogenes & P. aeruginosa. Individual diagnostic value includes IG (sensitivity 64.3%, specificity 75%), ANC (64.2%, 70.2%) and additional parameter of LNR (71.4%, 71.4%) . The best combination diagnostic value is found in IG, HFLC, NESFL with AUC 0.80, 95% CI 0.68 – 0.92 p <0.001, sensitivity 66%, specificity 84% which contains negative association to neutrocytic ascites bacterial infection. It produces a score system with similar AUC, sensitivity and specificity.

Conclusions: Culture and bacterial DNA results in ascitic bacterial infection (SBP, CNNA, bacterascites) 60.1% with almost equal proportion of gram positive & negative bacterial culture with ESBL resistance. IG, ANC & LNR have individual diagnostic value in neutrocytic ascitic bacterial infection, otherwise IG, HFLC and NESFL are combined cell population data parameters and yield a score system for neutrocytic ascites bacterial infection (SBP,CNNA).