Hubungan CA-125, FOLR1, dan HE4 Sebagai Penanda Keganasan pada Pasien dengan Tumor Ovarium di RSUP Dr. Cipto Mangunkusumo Tahun 2022-2023 = Corelation of CA-125, FOLR1, and HE4 as Malignancy Biomarkers in Patients with ovarian tumor at Dr. Cipto Mangunkusumo General Hospital, Faculty of Medicine University Indonesia in 2022-2023

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Abstrak

Latar belakang: Kanker ovarium merupakan jenis kanker ke-3 yang paling sering dialami oleh wanita di Indonesia. Diagnosis yang terlambat berperan besar dalam tingginya angka mortalitas. Metode skrining cepat kanker ovarium semakin penting untuk diteliti, dengan beragam biomarker penanda kanker seperti CA-125, HE4, dan FOLR1 yang menawarkan indeks diagnostik dan kemudahan prosedur yang menjanjikan.

Metode: Studi deskriptif desain potong lintang ini dilakukan di Rumah Sakit Umum Pusat Nasional Dr. Cipto Mangunkusumo, Jakarta pada Januari 2022 hingga Januari 2023. Kadar serum CA-125, HE4, dan FOLR1 dianalisis dari 48 subjek yang terbagi dalam kelompok tumor ovarium ganas dan jinak. Diagnosis pasti tumor merujuk hasil pemeriksaan histopatologis dan pencitraan. Data demografis pasien seperti usia, status menopause, ukuran tumor, hingga hasil analisis sitologi cairan asites dikumpulkan.

Hasil: Hasil analisis demografis menunjukkan kecenderungan subjek menopause untuk memiliki tumor ovarium non-maligna (57,6% vs. 26,7%; $p < 0,05$), dan subjek dengan cairan asites ganas cenderung memiliki tumor ovaium maligna (3,0% vs. 40,0%; $p < 0,05$). Kadar ketiga biomarker serum meningkat pada kelompok tumor maligna, namun hanya HE4 (median 12,43 vs. 42,03; $p < 0,05$) yang memiliki perbedaan bermakna (CA-125 median 102,50 vs. 461,85; $p = 0,062$; FOLR1 median 0,070 vs. 0,172; $p=0,213$). Area under the curve (AUC) pada hasil analisis kurva receiver operating characteristic (ROC) menunjukkan hasil 0,630, 0,747, dan 0,794 secara berturut-turut untuk biomarker FOLR1, Ca125, dan HE4, dengan analisis beda proporsi signifikan pada titik potong 0,1165 ng/mL (Se 66,7%, Sp 60,6%), 208,00 U/mL (Se 73,3%, Sp 84,8%), dan 19,66 pg/mL (Se 86,7%, Sp 60,6%). Analisis kombinasi biomarker menunjukkan peningkatan sensitifitas namun penurunan spesifisitas.

Kesimpulan: Kadar serum ketiga biomarker memiliki kemampuan yang baik sebagai prediktor keganasan tumor ovarium maligna. Pada populasi penelitian, HE4 secara tunggal memiliki indeks diagnostik terbaik, dan kombinasi biomarker tidak memberikan peningkatan kemampuan diagnostik.
.....Background : Ovarian cancer is the third most common cancer in women in Indonesia. Late diagnosis significantly contributes to high mortality rates. Rapid screening methods for ovarian cancer are increasingly important, with biomarkers such as CA-125, HE4, and FOLR1 offering promising diagnostic indices and procedural ease.

Methods: This cross-sectional descriptive study was conducted at Dr. Cipto Mangunkusumo National

Central General Hospital, Jakarta from January 2022 to January 2023. Serum levels of CA-125, HE4, and FOLR1 were analyzed in 48 subjects divided into malignant and benign ovarian tumor groups. Tumor type diagnosis was based on histopathological examination and imaging. Patient demographic data including age, menopausal status, tumor size, and cytology analysis of ascitic fluid were collected.

Results: Demographic analysis showed tendencies of menopausal subjects to have non-malignant ovarian tumors (57.6% vs. 26.7%; $p < 0.05$), and subjects with malignant ascitic fluid were more likely to have malignant ovarian tumors (3.0% vs. 40.0%; $p < 0.05$). Serum levels of all three biomarkers were higher in the malignant group, but only HE4 (median 12.43 vs. 42.03; $p < 0.05$) showed significant differences (CA-125 median 102.50 vs. 461.85; $p = 0.062$; FOLR1 median 0.070 vs. 0.172; $p = 0.213$). The area under the curve (AUC) for the receiver operating characteristic (ROC) curve analysis showed 0.630, 0.747, and 0.794 for FOLR1, CA-125, and HE4, respectively. Significant cut-off points were 0.1165 ng/mL (Se 66.7%, Sp 60.6%), 208.00 U/mL (Se 73.3%, Sp 84.8%), and 19.66 pg/mL (Se 86.7%, Sp 60.6%). Biomarker combination analysis increased sensitivity but decreased specificity.

Conclusion: Serum levels of the three biomarkers are good predictors of malignancy in ovarian tumors. In this study population, HE4 alone had the best diagnostic index, and combining biomarkers did not enhance diagnostic capability.