

ABSTRAK

Latar Belakang: Perjalanan alamiah penyakit kanker prostat terbukti melibatkan banyak perubahan pada gen yang menyebabkan perubahan sifat sel kanker yang semula sensitif menjadi resisten terhadap terapi kastrasi (*Castration Resistant Prostate Cancer/CRPC*) yang bersifat letal. Penelitian ini bertujuan mengetahui peran ekspresi mRNA dari TP53, PTEN, dan RB1, serta ekspresi protein AR-V7 dalam memprediksi waktu terjadinya CRPC dan *overall survival* pasien kanker prostat.

Metode: Penelitian ini merupakan kohort retrospektif yang memakai sampel blok paraffin jaringan pasien kanker prostat yang menerima *Androgen Deprivation Therapy* di RSUP Dr. Sardjito tahun 2016-2022 (n=107). Ekspresi mRNA dari TP53, PTEN, dan RB1 diukur menggunakan metode *quantitative Real Time Polymerase Chain Reaction* (qRT-PCR), sedangkan ekspresi protein AR-V7 dinilai menggunakan pemeriksaan imunohistokimia. Waktu terjadinya CRPC dan *overall survival* dianalisis menggunakan *Log-Rank* dan *Cox-regression*.

Hasil: Waktu terjadinya CRPC yang lebih pendek ditemukan pada kelompok pasien yang memiliki nilai ekspresi mRNA TP53 rendah dibandingkan mRNA TP53 tinggi (35,04 vs 46,45 bulan; p = 0,028), mRNA RB1 rendah dibandingkan mRNA RB1 tinggi (38,44 vs 46,14 bulan; p = 0,027), dan ekspresi protein AR-V7+ dibandingkan dengan AR-V7- (26,40 vs 56,83 bulan; p = 0,00). Berlawanan dengan itu, ekspresi mRNA PTEN tidak menunjukkan hubungan yang signifikan dengan durasi waktu terjadinya CRPC (43,04 vs 41,82; p = 0,694). Pada analisis angka *Overall Survival* ditemukan bahwa kelompok pasien dengan ekspresi protein AR-V7+ memiliki *Overall Survival* lebih buruk secara signifikan dibandingkan dengan AR-V7- (32,91 vs 56,94 bulan; p = 0,00). Tidak terdapat hubungan antara ekspresi mRNA PTEN (49,08 vs 51,21 bulan; p = 0,802), RB1 (47,19 vs 48,84 bulan; p=0,107) dan TP53 (42,12 vs 53,07; p = 0,077) dengan waktu *Overall Survival*.

Kesimpulan: Ekspresi mRNA dari TP53 dan RB1 yang rendah, serta protein AR-V7+ mampu memprediksi waktu terjadinya CRPC yang lebih pendek. Sedangkan nilai prediktif *Overall Survival* hanya ditunjukkan pada biomarker AR-V7.

Kata Kunci: Kanker prostat, TP53, PTEN, RB1, AR-V7, *Androgen Deprivation Therapy*, CRPC, *overall survival*

ABSTRACT

Background: *The natural course of prostate cancer has been shown to involve many alterations in genes that cause changes in the nature of cancer cells that were originally sensitive to become resistant to castration therapy (Castration Resistant Prostate Cancer/CRPC), which is lethal. This study aimed to determine the role of mRNA expression of TP53, PTEN, RB1, and protein expression of AR-V7 in predicting the time to CRPC and overall survival of prostate cancer patients.*

Methods: *This research is a retrospective cohort study using tissue paraffin block samples from prostate cancer patients receiving Androgen Deprivation Therapy at Dr. Sardjito General Hospital in 2016–2022 (n = 107). The mRNA expression of TP53, PTEN, and RB1 were measured using quantitative Real-Time Polymerase Chain Reaction (qRT-PCR) while the protein expression of AR-V7 was analyzed using immunohistochemistry. Time to CRPC and overall survival were analyzed using Log-Rank analysis and Cox-regression.*

Results: *A shorter CRPC onset time was found in the group of patients who had low TP53 mRNA expression values compared to high TP53 mRNA (35.04 vs 46.45 months; p-value 0.028), low RB1 mRNA compared to high RB1 mRNA (38.44 vs 46.14 months; p-value 0.027), and AR-V7+ protein expression compared to AR-V7- (26,40 vs 56,83 months; p-value 0.00). In contrast, PTEN mRNA expression did not show a significant association with CRPC duration time (43.04 vs. 41.82; p-value 0.694). In the analysis of overall survival, it was found that the group of patients with AR-V7+ protein expression had significantly worse overall survival compared to AR-V7- (32,91 vs 56,94 months; p=0.00). However, there was no association between mRNA expression of PTEN (49.08 vs 51.21 months; p=0.802), RB1 (47.19 vs 48.84 months; p=0.107) and TP53 (42.12 vs 53.07; p-value= 0.077) with Overall Survival time.*

Conclusion: *The lower TP53 and RB1 mRNA expression and AR-V7+ protein expression have a predictive value for a shorter time to CRPC. However, the predictive value of Overall Survival was only shown by AR-V7 protein expression.*

Keywords: *Prostate cancer, TP53, PTEN, RB1, AR-V7, Androgen Deprivation Therapy, CRPC, overall survival*