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Safety profile and therapeutic efficacy of one cycle of [177Lu] PSMA in end stage metastatic castration resistant prostate cancer patients with low performance status

Introduction
Prostate cancer patients with distant metastasis have a poor prognosis and developed resistance to all standard drugs at various time intervals. A therapeutic option which can alleviate symptoms and prolong survival is in-search for these patients. [177Lu] prostate specific membrane antigen ([177Lu]PSMA) is a novel drug based on the theranostic concept. Here, we have presented the safety and efficacy profile of one cycle of [177Lu]PSMA in metastatic castration-resistant prostate cancer (mCRPC) patients who have exhausted all standard therapeutic options.
Methods
Twenty-two patients treated with at least first line anti-androgens and docetaxel were treated with one cycle of [177Lu]PSMA therapy on a compassionate basis. Haemoglobin, total leukocyte counts, platelets and serum creatinine for toxicity profile while prostate-specific antigen (PSA), eastern cooperative oncology group (ECOG) performance status, visual analogue scale (VAS) and analgesic quantification scale (AQS) for therapeutic efficacy were recorded pre and 8 weeks post-therapy. Wilcoxon signed-rank and ANOVA tests were used for statistical analysis.
Results
Partial response (PR), stable disease (SD) and progressive disease (PD) for PSA were seen in 5 (22.7%), 13 (59.1%) and 4 (18.2%) patients respectively treated with mean 6.88GBq dose of [177Lu]PSMA. 8/22 (36.4%) patients showed ≥ 30% drop in PSA. Grade 3 haemoglobin toxicity was seen in 5/22 (22.7%) patients. No patient developed grade 4 haemoglobin toxicity. No patients had grade 3 or 4 leukocytopenia or thrombocytopenia. Wilcoxon signed-rank test showed statistical significant ($p < 0.05$) difference in pre and post-treatment ECOG, VAS, AQS scores while it was insignificant for PSA ($P > 0.05$). ANOVA test showed a statistically significant difference in mean doses of [177Lu]PSMA used in three PSA response group while the difference was non-significant for other variables.
Conclusion
We concluded that [177Lu]PSMA therapy has adequate pain palliation in all end-stage mCRPC patients and it has the potential to become an effective therapeutic option in properly selected patients.

Keywords: [177Lu]PSMA, Safety, efficacy, mCRPC

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