ELSEVIER

Urologic Oncology: Seminars and Original Investigations 37 (2019) 571

UROLOGIC ONCOLOGY

Letter to the Editor

Replay by authors: Serum testosterone level is a useful biomarker for determining the optimal treatment for castration-resistant prostate cancer

We have reviewed with interest the recent article by Hashimoto et al. "Serum testosterone level is a useful biomarker for determining the optimal treatment for castration-resistant prostate cancer" [1]. The authors reported on the potential for serum testosterone measurement to predict the response to abiraterone or enzalutamide of patients with castrated-resistant prostate cancer (CRPC). After the analysis of this retrospective study 2 relevant facts would be highlighted: (i) patients with very low serum testosterone levels (<5 ng/dl) seems to have lower PSA progression free survival and overall survival than those patients with low levels (5−50 ng/dl); (ii) patients with very low testosterone levels which received abiraterone had greater rate of PSA responses than those who underwent enzalutamide (62% vs. 32%), although overall survival was not statistically different. The authors conclude that serum testosterone is a useful biomarker for informing treatment selection for CRPC.

In my opinion the authors of this interesting study can hypothesize that serum testosterone measurement may be useful to select the treatment for CRPC, however an important limitation of this study has not been taken into account. The authors reported that ARICHITET II chemiluminiscent immunoassay (CLIA) was used to measure serum testosterone. CLIAs are worldwide used in clinical laboratories to measure serum testosterone from the latest nineties given that they are very sensitive, automatable, fast and inexpensive methods, but despite a disturbing lack of accuracy and reproducibility, especially when low levels are measured. In 2007 the Endocrine Society and the Centre for Disease Control and Diagnosis recommended only methods using chromatography and mass spectrometry to measure testosterone, especially in children and women [2]. Nonetheless we want to emphasize that all the recent studies looking for the optimal level of serum testosterone after medical castration have been carried out using distinct CLIAs [3,4]. We recently demonstrated that 2 commercial CLIAs measured differently the testosterone levels of patients with PC undergoing androgen suppression. The median levels were 7.8 and 33.4 ng/dl, the rate values up to 20 ng/dl were 77.5% and 24.9% and behind 50 ng/dl were 0.8% and 21.3% respectively [5]. We also have demonstrated the lack of accuracy of 1 CLIA compared to liquid chromatography and tandem mass spectrometry which is an appropriate method to measure low levels of serum testosterone. The median levels were 31.9 and 14 ng/dl and the rate of levels up to 20 ng/dl were 27.1% and 65.9% respectively [6].

To summarize, the accurate measurement of low levels of serum testosterone in patients with PC undergoing androgen suppression must be measured with liquid chromatography and tandem mass spectrometry [7]. Therefore, the findings of Hashimoto et al. [1] should be confirmed using an appropriate method to measure serum testosterone.

Conflicts of interest

Juan Morote has been advisor and speaker of Astellas, Ipsen, Jansen, Amgen, GP Pharm, and Glaxo Smith Klein.

Juan Morote, M.D., Ph.D.
Imma Comas, M.D.
Department of Urology and Biochemestry, Vall d'Hebron Hospital Campus, Universitat Autonoma de Barcelona, Barcelona, Spain

References

[1] Hashimoto K, Tabata H, Shindo T, et al. Serum testosterone level is a useful biomarker for determining the optimal treatment for castration-resistant prostate cancer. Urol Oncol 2019:16.pii:S1078-1439 (19) 30159-0. https://doi.org/10.1016/j.urolonc.2019.04.026.

[2] Rosner W, Auchus RJ, Azziz R, et al. Position statement: utility, limitations, and pitfalls in measuring testosterone: an Endocrine Society position statement. J Clin Endocrinol Metab 2007;92:405–13.

[3] Morote J, Orsola A, Planas J, et al. Redefining clinically significant castration levels in patients with prostate cancer receiving continuous androgen deprivation therapy. J Urol 2007;178:1290–5.

[4] Morote J, Regis L, Celma A, et al. Measurement of serum testosterone during androgenic suppression in patients with prostate cancer: a systematic review. Actas Urol Esp 2016;40:477–84.

[5] Morote J, Comas I, Planas J, et al. Behavior of chemiluminescent assays to measure serum testosterone during androgen deprivation therapy. Int J Urol 2016;23:957–8.

[6] Morote J, Comas I, Planas J, et al. Serum testosterone levels in prostate cancer patients undergoing luteinizing hormone-releasing hormone agonist treatment. Clin Genitourin Cancer 2017;16:e491–6. https://doi.org/10.1016/j.urolonc.19.04.026.

[7] Morote J, Comas I, Planas J. Re: Nicolas Mottet, Joaquim Bellmunt, Erik Briers, et al. EAU-ESTRO-ESUR-SIOG Guidelines on Prostate Cancer. European Association of Urology; 2017. http://uroweb.org/guideline/prostate-cancer. How to Assess the Efficacy of Medical Castration. Eur Urol 2018; 73:e134-5.

https://doi.org/10.1016/j.urolonc.2019.05.016