

Low cost abiraterone

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Abiraterone is approved in combination with prednisone and a luteinizing hormone-releasing hormone (LHRH) analogue for castration-resistant prostate cancer (CPRC) patients progressing in the form of previa [1] or after treatment with docetaxel [2].

CPRC patients treated with abiraterone should take four tablets on an empty stomach one hour before breakfast, 10 mg of prednisone, and continued treatment with analogue LHRH [3].

It is an effective drug but at a cost of €36,693 per patient per year [4]. In addition, the LHRH analogue costs from €972 to €1788 per patient per year [5] (€81–€149 per month depending on the European country).

Is it necessary to maintain this very expensive therapeutic scheme? Can we obtain the same results at a lower cost?

Theoretically abiraterone treatment can be nearly 80% cheaper with the same therapeutic results. This can be achieved with two modifications to current treatment:

1) Suppression of the LHRH analogue

It has been shown that the reboot in the production of testosterone by the testis after suspending the hormonal blockade is dependent on the duration of blockade [6].

After a year of hormonal blockade, in order to suspend it 73 to 100% of the patients recovered normal levels of testosterone within six months [7].

However, after three years of hormonal blockade only 0 to 18% of patients recovered the levels of testosterone at six months [8].

Regardless of the low production of testosterone in patients blocked for years, abiraterone suppresses the production of testosterone by the testis due to the fact that it blocks the synthesis of testosterone.

There are two phase II studies currently evaluating the use of single abiraterone; one is still recruiting patients, and the other, which will present its results in the year 2016 [10], published a small retrospective series of patients with the use of abiraterone without LHRH analogue in which all patients maintained values of testosterone in castration range [11].

So in patients with CPRC after several years of hormonal blockade it could be possible to discontinue the use of the LHRH analogue.

2) Reduce the dose of abiraterone to 250 mg per day

If, according to the datasheet of the FDA [12], a meal of 300 Kcal and 7% fat increases by about five times ($5 \times$ AUC and $C_{max} 7 \times$) the bioavailability, then one tablet (250 mg) taken together with a standardised light breakfast – less than 300 Kcal and 7% fat – should produce abiraterone levels similar to those obtained with 1000 mg/day on an empty stomach [4].

According to our calculations, this is done by taking the abiraterone pill with a 150-cc glass of whole milk.

Thus, a container of abiraterone would serve for four months of treatment and is not continuous with the LHRH analogue, with a consequent reduction in medical costs of treatment of the CPRC in comparison with other treatment alternatives, would be the most profitable from the point of view of cost benefit. It remains to wait for the results of prospective studies to endorse this dosage of abiraterone.

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