

Side Effects and Complications of Androgen Deprivation Therapy in the Treatment of Metastatic Prostate Cancer

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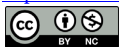
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Abstract

Introduction: Androgen deprivation therapy is the standard treatment for metastatic prostate cancer. Its palliative action aims to improve patients' quality of life through better control of the disease. Androgen deprivation therapy causes side effects that are often overlooked in light of the expected benefits in terms of cancer control. Side effects can be cardiovascular, metabolic, sexual, skeletal and neurophysiological. **Patients and methods:** Retrospective study collecting the records of patients who underwent androgen deprivation therapy for the management of metastatic prostate cancer between January 2022 and December 2024 at the Urology-Andrology Department of the Ouakam Military Hospital. **Results:** 82 patients were included in the study. The average age of patients was 68.6 years. Androgen suppression was surgical in 76.8% of cases and medical in 23.2%. Hot flushes were reported by 91.4% of patients. Sexual disorders consisted of erectile dysfunction (64.6%), decreased libido (79.2%) and decreased penis size (20.7%). Metabolic complications included obesity (10.9%) and type 2 diabetes (3.6%). Femoral neck fractures were observed in 6.09%. Thirty-two percent of patients had severe anemia requiring blood transfusion. Nineteen percent of patients reported concentration problems. Mortality was 15.8% (n = 13). **Conclusion:** Pre-treatment assessment is a necessary step in screening for cardiovascular risk factors and osteopenia in order to optimise the management of the side effects of androgen suppression.

Keywords

Androgen Deprivation Therapy, Metastatic Prostate Cancer, Side Effects, Complications

1. Introduction

Androgen deprivation therapy is the standard treatment for metastatic prostate cancer. Its palliative action aims to improve patients' quality of life by better controlling the disease [1] [2]. It can be achieved through various methods of castration, which may be chemical (LH-RH agonists or antagonists) or surgical (bilateral orchiectomy). Androgen deprivation therapy frequently causes side effects that are often overlooked in light of the expected benefits in terms of cancer control. Side effects can be cardiovascular, metabolic, sexual, skeletal, and neurophysiological [3] [4]. The objective of this study was to report the side effects and complications of androgen suppression in patients being treated for metastatic prostate cancer at the Urology-Andrology Department of the Ouakam Military Hospital.

2. Patients and Methods

This is a retrospective descriptive study that examined the records of patients who underwent androgen deprivation therapy as part of the management of metastatic prostate cancer between January 2022 and December 2024 at the Urology-Andrology Department of the Ouakam Military Hospital. All patients had metastatic prostate adenocarcinoma. Pre-treatment counselling was provided to all patients regarding the side effects of hormone deprivation. The parameters studied were age, medical history, type and duration of androgen deprivation, various side effects, and complications. The data were collected on a survey form from the files of patients followed in consultation or hospitalized in our department for metastatic prostate cancer under hormone therapy. Excel 2007 Software was used for statistical analysis.

3. Results

During the study period, 82 patients were included in the study. The average age of patients was 68.6 years, ranging from 47 to 91 years. The 61 - 70 age group was the most represented (**Figure 1**).

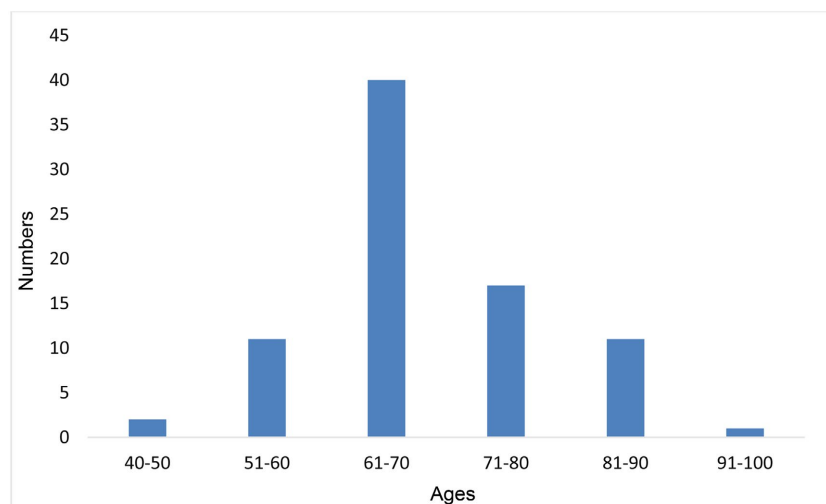


Figure 1. Distribution of patients according to age groups.

Seventy-four per cent of patients had a medical history, with high blood pressure and type 2 diabetes observed in 21.9% and 14.6% of patients, respectively (**Table 1**).

Table 1. Patients' medical history.

Medical history	Numbers	Percentage
High blood pressure	18	21.9
Type 2 diabetes	12	14.6
Cataract	10	12.1
Chronic obstructive pulmonary disease	8	9.7
Glaucoma	7	8.5
Hyperuricemia	6	7.3
Rheumatoid arthritis	3	3.6
Gastroduodenal ulcer	2	2.4
Myocardial infarction	1	1.2

The average duration of androgen suppression was 13.1 months, ranging from 3 to 31 months. Androgen suppression was surgical (bilateral orchiectomy) in 76.8% of cases and medical (injection of 10.8 mg of goserelin) in 23.2% of cases. Hot flushes were reported by 91.4% of patients, affecting 92% of patients who had undergone bilateral orchiectomy (58/63) and 89% of patients receiving Goserelin injections (17/19). Sexual disorders consisted of erectile dysfunction spontaneously reported by 64.6% of patients, decreased libido (79.2%), and decreased penis size (20.7%). Metabolic complications included obesity (10.9%) and type 2 diabetes (3.6%). Femoral neck fracture, observed at 6.09%, was the only bone complication reported. Four of these patients died within 6 months of the bone event. Bone densitometry, which was unavailable during this period, was not performed. Thirty-two per cent of patients had severe anemia requiring blood transfusion. Nineteen percent of patients who were still professionally active reported concentration difficulties. The various side effects and complications are listed in **Table 2**.

Table 2. The different side effects and complications of patients.

Side effects and complications	Numbers	Percentage
Hot flashes	75	91.4
Erectile dysfunction	53	64.6
Decreased libido	65	79.2
Penis size reduction	17	20.7
Gynecomastia	3	3.6

Continued

Obesity	9	10.9
Type 2 Diabetes	3	3.6
Femoral neck fracture	5	6.09
Anemia	27	32.9
Asthenia	21	25.6
Trouble concentrating	16	19.5

Mortality was 15.8% (n = 13) at the time of the study.

4. Discussion

Androgen suppression reduces serum testosterone levels from normal to castration levels. Castration is effective if testosterone levels are below a threshold of 50 ng/dl or less than 5% of normal levels [5]. Androgen suppression causes side effects that can affect patients' quality of life and complications that can be life-threatening. Clear communication with patients on this subject is necessary before starting treatment.

Hot flushes are one of the most common side effects in patients undergoing androgen suppression. They affect 50 to 80% of patients and can occur several times a day [2] [6]. In our study, the frequency of hot flushes did not vary significantly according to the type of castration (92% for bilateral orchiectomy and 89% for goserelin injections). These results are comparable to those of Kaisary *et al.* [7], who compared two groups: 152 patients treated with LHRH analogue and 163 patients who had undergone bilateral orchidectomy. Hot flushes were observed in 63% of patients on analogue and in 60% of patients who had undergone orchidectomy. The reason for this difference may be due to our study's small population size.

Sexual disorders appear as soon as androgen suppression begins, and their frequency varies between 70 and 90% [8]. In our psychosocial context, sexual dysfunction is a constant concern for patients when they begin to feel better after starting androgen deprivation therapy. The impact of sexuality must be considered when choosing the type of androgen deprivation. The fear of cancer progression does not always outweigh the desire for a fulfilling sex life, which is an important aspect of the health and well-being of men and their partners [9] [10]. Most of these men undergoing androgen suppression will not regain their previous sexual function, hence the need to help couples build and maintain a fulfilling intimacy that will have a positive impact on the psychological well-being of patients [11] [12].

In our study, metabolic complications included obesity (10.9%) and type 2 diabetes (3.6%). In Cameroon, Mbouche *et al.* [13] reported 23.9% obesity and 8.6% type 2 diabetes. Several authors have observed that more than 50% of patients

undergoing long-term androgen suppression therapy will develop metabolic syndrome, which is a recognised risk factor for cardiovascular disease [14] [15]. The two parameters that promote this metabolic syndrome are obesity and hyperglycemia, which are frequently observed in androgen suppression [16]. Hence, there is a need to screen for and manage these cardiovascular diseases before starting treatment.

Hypogonadism is associated with a loss of bone mineral density and an increased risk of fractures. In our study, 5 patients (6.09%) had femoral neck fractures and 4 died within 6 months of the accident. Apart from the direct effects on bone mineral density, the impact of androgen suppression on lean body mass and muscle strength also contributes to the risk of falls and fractures [17]. It has been reported that men treated with continuous androgen suppression experience a progressive loss of bone density in the femoral neck and lumbar spine, particularly during the first 6 months [18]-[20].

Thirty-two percent of patients had severe anemia requiring transfusion. Ziouziou *et al.* [3] report that hemoglobin levels decrease by approximately 1 to 2 g/dl during the first 6 months of androgen deprivation therapy. Our study has a limitation in that it's difficult to distinguish anemia caused by this deprivation from that caused by bone marrow invasion by cancer.

Men with prostate cancer are at risk for depression and cognitive decline [21]. In a meta-analysis, Sun *et al.* [22] reported a decline in at least one cognitive function in 47% of patients after three months of androgen suppression.

This study has limitations due to its retrospective nature. Several aspects of monitoring and managing the side effects and complications of androgen suppression, such as dyslipidemia, cardiovascular events, and bone density assessment, are not always considered in the records. All deaths occurred outside the institution, which made it difficult to determine the causes.

5. Conclusion

The management of patients undergoing hormone therapy must be comprehensive. Screening for cardiovascular risk factors and osteopenia is important in order to optimise the management of the side effects of androgen suppression and improve patients' quality of life. Pre-treatment assessment is a necessary step before starting treatment and during follow-up. A formal screening protocol or a multidisciplinary care pathway must be implemented for patients starting androgen deprivation therapy.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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