SRYAHWA PUBLICATIONS

Archives of Urology
ISSN: 2638-5228 | Volume 7, Issue 2, 2025
https://doi.org/10.22259/2638-5228.0702011

RESEARCH ARTICLE

Age-Related Androgen Deficiency in the Urology Department of the Gabriel Touré University Hospital Centre

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Received: 21 October 2025 Accepted: 14 November 2025 Published: 18 November 2025

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Abstract

Objective: To study age-related androgen deficiency (ARAD) in the urology department of Gabriel Touré University Hospital.

Patients and Methods: This was a prospective descriptive study of cases of (ARAD) in the urology department of Gabriel TOURE Hospital in Bamako, Mali. The study was conducted over a period of one year, from 1 January 2020 to 31 December 2020.

Results: During the study period, we received 1,951 patients for consultation at the urology department of the Gabriel Touré University Hospital, including 31 cases of ARAD, representing a frequency of 1.58%. The average age was 65 years. Married men were [the] most common, representing 77.4% of cases. Nearly half of the patients were businesspeople, representing 45.2% of cases. ARAD appeared gradually in 64.5% of patients. Nearly half of the patients had consulted for sexual asthenia (41.9%), followed by 35.5% for decreased libido. Most patients had sexual intercourse twice a week (45.2%) before the onset of the disorder. Nearly half of the patients had suffered from the disorder for several years (51.6% of cases). Most patients reported unchanged libido in 58.1% of cases. The majority of our patients were hypertensive in 38.7% of cases. Fasting blood glucose was normal in almost all non-diabetic patients, i.e. 48.39% of cases. Testosterone levels were decreased in 100% of cases. Prolactin levels were normal in more than 51.6% of patients. Serum FSH levels were normal in almost all patients, 74.2%. TSH levels were normal in the majority of patients, 71%. Nearly half of the patients had resorted to self-medication several months before their first consultation at the urology department, 58.1%. All our patients had undergone medical treatment. Most of our patients, 71%, showed progressive improvement in their health. In our series, androgen deficiency was observed in 67.7% of cases. According to the IIEF5 score, the following were normal in 38.7% of cases, mild in 22.6% of cases, slightly moderate in 12.9% of cases, and severe in 9.7% of cases. According to the AMS score, the following were normal in 32.3% of cases, mild in 32.3% of cases, moderate in 22.6% of cases, and severe in 12.9% of cases.

Conclusion: ARAD seriously impairs clinical and biochemical signs and overall quality of life in older adults. Knowledge is incomplete and sometimes unclear, and some aspects of androgen replacement therapy remain controversial.

Keywords: Testosterone, Deficiency, Aging.

Citation: Mamadou Tidiani Coulibaly, Moussa Salifou Diallo, Amadou Kassogué, *et al*. Age-Related Androgen Deficiency in the Urology Department of the Gabriel Touré University Hospital Centre. Archives of Urology 2025;7(2): 50-55.

1. Introduction

Age-related androgen deficiency (ARAD) is a clinical syndrome associated with advancing age, characterized by a deterioration in quality of life and/or the function of certain organs or systems, secondary to the deleterious effects of an abnormal and constant decrease in serum androgens, with or without a decrease in androgen sensitivity. [1]

However, we would like to emphasize that aging is not a disease. This syndrome must cause a real deterioration in quality of life and/or the functioning of several organs.

Between 2000 and 2050, the number of people over the age of 65 worldwide is expected to rise from the current 400 million to 1.5 billion. [2]

The incidence of hypogonadism symptoms in men aged 40 to 79 ranges from 2.1 to 5.7%. Hypogonadism is more prevalent in older men, men who are obese, men with comorbidities, and men in poor health. [3]

In a larger population of men, many of whom have comorbidities, the prevalence of hypogonadism may increase with age (e.g., the Baltimore Longitudinal Study of Aging). [4]

In a study conducted in Massachusetts, the prevalence of symptomatic ANDROGEN DEFICIENCY was similar in men aged 40 to 49 (4.1%) and between 50 and 59 (4.5%), but increased in men aged 60 to 70 (9.4%) [5], and men aged 70 to 79 was 18.1%.

In 2019, Mr. LAHMOUAD noted a frequency of 25% in Morocco. [6]

In 2021, a study was conducted in Mali on erectile dysfunction in people with age-related androgen deficiency at the Gabriel Touré University Hospital, with a frequency of 1.84%. [7]

DALA can be assessed using several tools, either through one or more questionnaires: ADAM questionnaire, IIEF5 questionnaire, AMS questionnaire.

The biochemical diagnosis of DALA is based on measuring total or bioavailable testosterone levels in a blood sample.

Before proposing a specific treatment, the patient's actual needs must first be assessed, as well as their motivation for treatment, and they must be informed of the potential risks of treatment and the need for regular monitoring. [8]

The management of DALA is based primarily on testosterone replacement therapy in order to restore sufficient libido and satisfactory sexual relations.

In Mali, our study would be the first specific study on DALA both in hospitals and in the general population, which is why we initiated this work in the urology department of the Gabriel TOURE University Hospital.

2. Patients and Methods

This was a prospective descriptive study conducted in the urology department of Gabriel Touré Hospital in Bamako, Mali.

The study was conducted over a period of one year, from January 1, 2020, to December 31, 2020.

2.1 Inclusion Criteria

All patients aged 50 years or older who were seen during urology consultations, had LUTS, and agreed to participate in the study.

2.2 Exclusion Criteria

All patients under the age of 50 who were seen during urology consultations and did not have LUTS.

2.3 Diagnostic Criteria

Total testosterone is the most accessible and easiest test to perform, but it does not reflect the actual active fraction of testosterone. It will be performed on all our patients.

2.4 Gonadotropins

LH and FSH levels must be measured when testosterone is low. Prolactin: remains the rule in cases of a sharp drop in testosterone with low LH.

2.5 Variables Collected

Sociodemographic data: age, education level, residence, ethnic group, occupation.

Dietary habits: alcohol, tobacco.

Anthropometric Data: weight, height, weight/height ratio.

Clinical Data: testicular damage (hypotrophy, atrophy), biology, treatment, progression. Questionnaires and AMS, ADAM, and IIEF5 scores.

3. Results

During our study period, we received 1,951 patients for consultation at the urology department of Gabriel TOURE University Hospital, including 31 cases of DALA, representing a frequency of 1.58%. The average age was 65 years, with a standard deviation of 1.70 years and extremes of 50 and 80 years. The 60-65 age group was the most represented, accounting for 29% of cases. Married men were the

most represented, accounting for 77.4% of cases. Nearly half of the patients were traders, accounting for 45.2% of cases. The Bambara were by far the most represented, accounting for 42% of cases, followed by the Malinke, accounting for 19.4% of cases. Most of our patients came from urban areas, accounting for 77.4% of cases. The vast majority of patients came for consultation on their own initiative, accounting for 71% of cases.

DALA had developed gradually in 64.5% of patients. Nearly half of patients had consulted for sexual asthenia (41.9%), followed by 35.5% for decreased libido. Most patients had sex twice a week (45.2%) before the onset of symptoms. Nearly half of the patients had been suffering for several years (51.6% of cases). Most patients reported no change in libido (58.1% of cases). The majority of our patients were hypertensive (38.7% of cases). The majority of patients were regular smokers. Most patients reported not masturbating. Nearly 64.5% of patients had normally developed male secondary sexual characteristics. Among the abnormalities found during rectal examination, benign prostatic hypertrophy was the most commonly reported. Fasting blood glucose levels were normal in almost all non-diabetic patients, i.e., 48.39% of cases. Testosterone levels were decreased in 100% of cases.

The majority of our patients had normal creatinine levels (80.6%). Prolactin levels were normal in more than 51.6% of patients. Serum FSH levels were normal in almost all patients (74.2%). TSH levels were normal in the majority of patients (71%). PSA levels were normal in 90.3% of patients. Nearly half of the patients had resorted to self-medication several months before their first consultation in the urology department, i.e., 58.1%. All of our patients had undergone medical treatment.

Most of our patients experienced a gradual improvement in their health, i.e., 71%. In the series, an androgen deficiency was noted in 67.7% of cases. According to the IIEF5 score, a normal score was noted in 38.7% of cases, a mild score in 22.6% of cases, a slightly moderate score in 12.9% of cases, and a severe score in 9.7% of cases.

According to the AMS score: it was normal in 32.3% of cases, mild in 32.3% of cases, moderate in 22.6% of cases, and severe in 12.9% of cases.

Table I. *Distribution of patients by age.*

Age	Frequency	Percentage (%)
50-55	3	9,7
55-60	6	19,4
60-65	9	29
65-70	2	6,5
70-75	4	12,9
75-80	7	22,6
Total	31	100

Table II. *Distribution of patients according to the method of DALA installation.*

Installation	Frequency	Percentage (%)
Progressive	20	64,5
Brutal	11	35,5
Total	**31**	**100**

Table III. *Distribution of patients according to reason for consultation.*

Reason for consultation	Frequency	Percentage (%)
Sexual asthenia	13	41,9
Short orgasm	2	6,5
Rapid detumescence	5	16,1
Decreased libido	11	35,5
Total	31	100

Table IV. *Distribution of patients according to duration of DALA disorders.*

Duration of the disorders	Frequency	Percentage (%)
< 1 month	6	19,4
< 1 year	9	29
> 1 year	16	51,6
Total	**31**	**100**

Table V. *Distribution of patients according to the results of the clinical examination.*

Physical sign	Frequency	Percentage (%)
Gynecomastia	3	9,7
Testicular hypoplasia	5	16,1
Genital malformation	2	6,4
Testicular hypotonia	1	3,2
No anomalies found	20	64,5
total	**31**	**100**

4. Discussion

4.1 Frequency

In our series, we received 1,951 patients for consultation in the urology department of the Gabriel TOURE University Hospital, including 31 cases of DALA, representing a frequency of 1.58%.

4.2 Sociodemographic Characteristics

4.2.1 Age

The average age was 65 years, standard deviation= 1.70 years, with extremes of 50 and 80 years; the 60-65 age group was the most represented with 29% of cases. This result is higher than that of Meriem Lahmouad [6], where the 60-65 age group represented 25% with an average age of 61.5 years.

4.2.2 Occupation

In our series, merchants are the most represented, accounting for 41.16% of cases.

4.2.3 Marital Status

Married men represent 77.41% of cases.

4.3 Clinical Study

During TDS (testosterone deficiency syndrome), erectile dysfunction is organic in origin. Erections generally take longer to achieve despite increasingly intense stimulation. Detumescence is also faster and the refractory phase is longer. A decrease in libido should be investigated during the consultation, as well as a reduction in the frequency of sexual intercourse. Finally, the patient may report a reduction in volume and weakness in sperm expulsion.

In our study, DALA developed gradually in most patients (64.51%). In some cases, it began as simple sexual asthenia (41.96%), which progressed to an inability to achieve or maintain a normal erection.

The vast majority of patients came to the consultation on their own initiative (77.4%), and nearly half had been suffering for several years (51.61%), with libido decreasing over time (35.48%).

4.4 Additional Tests

At the end of the initial consultation, standard additional tests were systematically requested: these involved measuring total testosterone levels in a blood sample taken between 8 and 10 a.m. on an empty stomach.

As a second step, a low testosterone level was confirmed by a second test performed a few weeks later under the same conditions, along with LH, FSH, and prolactin levels.

Other additional tests to be requested:

- A biological assessment (complete blood count, PSA, HDL, LDL, triglycerides, blood sugar) will be requested.
- An ultrasound scan of the external genital organs.
- In most cases (more than 50%), the results of these tests were normal.

4.5 Treatment

4.5.1 First line Treatment

After the initial consultation and while awaiting further tests, we gave practical advice to all our patients, including stopping certain harmful behaviors (hyperactivity, among others) and giving up self-medication, even for patients whose psychological disorder seemed obvious (socioeconomic difficulties, stress, tobacco, alcohol, etc.).

4.5.2 Hormone Treatment

The goal of treating DALA is to bring testosterone levels closer to physiological values. It is based on hormone replacement therapy, which will be initiated when the indication is clear based on the combination of clinical signs suggestive of DALA and its biological confirmation by two testosterone tests.

To ensure the treatment is safe, it is necessary to respect the contraindications and monitor the patient. When properly administered, androgen therapy can restore libido, improve quality of life, and prevent osteoporosis.

In our series, 100% of our patients received intramuscular hormone replacement therapy with one ampoule of Androtardyl every three weeks.

4.6 Progress

71% of our patients reported gradual improvement over several months of treatment, 16.13% of cases showed intermittent improvement, and 12.9% showed no change during the study period.

4.6.1 Treatment of associated conditions

Some patients only became aware of their elevated blood pressure and/or fasting blood sugar levels through the results of routine tests and additional tests requested; and when hypertension or diabetes was confirmed after several checks, these patients were referred to specialist services.

4.7 Link between the Clinical and Biochemical Characteristics of Age-Related Androgen Deficiency

4.7.1 Testosterone Deficiency and Hormonal Disorders

Cross-sectional and longitudinal studies show an increase in serum LH and FSH concentrations with age. During 15 years of observation in the New Mexico Aging Study, the mean serum LH concentration increased from 9.4 mIU/mL to 13.7 mIU/mL and FSH from 14.1 mIU/mL to 27.4 mIU/mL. [9]

In the Massachusetts Male Aging Study, LH increased by 0.9% per year and FSH by 3.1% per year. This increase in serum gonadotropins suggests that a degree of primary hypogonadism is responsible for the decline in testosterone,

supported by the weaker response of testosterone to human chorionic gonadotropin (HCG) or recombinant human LH in older men than in younger men.

In several aspects of LH secretion, the magnitude appears to be lower in older men than in younger men. The LH response to a gonadotropin-releasing hormone (GnRH) bolus is slightly lower in older men than in younger men, and the maximum response is somewhat delayed. Spontaneous LH pulses are also different in older men. The amplitude of the LH secretion surge is lower in older men than in younger men. The decline in testosterone with age therefore appears to be the result of a combination of primary and secondary hypogonadism. [10] As shown in the European study on aging in men, age itself seems to lead to more primary hypogonadism, comorbidity, and obesity, and more secondary hypogonadism. [11]

In our series, there is a significant association between LH levels (p=0.013) and testosterone deficiency. This result is similar to that of Meriem Lahmoud [6], who found respectively: LH p=0.093

4.8 Link between Quality of Life and DALA

4.8.1 Relationship between ADAM Score and Testosterone Deficiency

In a study conducted in China, the Androgen Deficiency in Older Men (ADAM) questionnaire found no significant association between total testosterone concentration and its score. [12]

However, age was significantly associated with ADAM (OR 1.14, 95% CI 1.05–1.23) and AMS (OR 1.03, 95% CI 1.01–1.08) questionnaire scores. [13]

In our study, 67.74% had an androgen deficiency according to the ADAM score, which proves a strong association between these two parameters. This result is significantly higher than that of Meriem Lahmouad [6], who found a frequency of 53.64%.

4.8.2 Relationship between IIEF5 Score and Testosterone Deficiency

However, certain sexual disorders are correlated with the severity of androgen deficiency in older men. Decreased libido can occur even when plasma androgen concentrations are still at high levels. On the other hand, ED appears later when androgen levels are well below normal. [14]

These various sexual disorders also vary with age. Decreased testosterone levels are correlated with ED in older men and decreased libido in younger men. Aging and androgen deficiency are therefore significant risk factors for ED. [15]

In our study, more than 61.3% of patients had a low IIFE score of 5. This result is similar to that of Meriem Lahmouad [6] in the 45-78 age group, who found a frequency of 52%. This shows the strong relationship between these two parameters, and these data are consistent with the literature.

4.8.3 Relationship between AMS Score and Testosterone Deficiency

In a study conducted in Iran (2015), most men (38.6%) suffering from mild and severe diseases (27.1%) presented symptoms of hypogonadism according to the severity intensity on the AMS scale [16]. The results showed that men experienced mild symptoms of hypogonadism with an average score of 33.81 ± 11.36. In this regard, one study reported an average score of 34.5 ± 11.6 in Japan [17], and another study in Turkey reported an average score of 30.98 ± 10.93 using the AMS scale [18].

In our study, 68% of those with a high AMS score had low testosterone levels. This result is significantly

lower than that of Ms. Meriem Lahmouad [6], who found 82.76%. Therefore, there is a strong association between these two parameters, which is inconsistent with the literature.

5. Conclusion

The medical community's interest in endocrine deficiencies in aging men is growing in line with the aging of the population.

Although knowledge about androgen deficiency in older men has advanced, it is still incomplete, sometimes confusing, and certain aspects of androgen replacement therapy remain controversial.

This means that several medical specialties and a multidisciplinary team, including urologists, endocrinologists, geriatricians, sexologists, and psychologists/psychiatrists, need to be familiar with the consequences, the necessary investigations, the therapeutic modalities, and the monitoring of treatment.

Conflict of Interest: None

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