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Pre-And post-Androgen deprivation lipid profiles of men with prostate cancer A multi-center study

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***Abstract*---**Introduction: Dyslipidemia is the primary cause of hospitalization and death in men with advanced prostate cancer. Our goal was to examine how androgen deprivation therapy (ADT) affects lipid profiles in Indian men with locally progressed or metastatic prostate cancer. Methods: this multi center study was conducted in LRH urology department From jan 2020 to jan 2021 Patients with prostate cancer who received ADT and for whom lipid account data from the first two years of ADT treatment was available were split into two groups for retrospective analysis. Members of Group A had bilateral orchidectomy, whereas those in Group B were given a luteinizing hormone-releasing hormone agonist (LHRHa). The information considered are quality standards, prostate-specific antigen (PSA), and lipid profiles. Results: 69 eligible patients were divided evenly between teams A (29) and B (40). After starting ADT, the median blood PSA level dropped significantly in both groups and

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remained low until 24 months. At six months, there was a statistically insignificant decline in all lipid profile parameters in team A patients except for high-density lipoprotein cholesterol. Overall cholesterol (11.9%), triglycerides (22.2%), and low-density lipoprotein cholesterol (21.1%) all improved significantly after six months among team B clients and returned to near normal after a year and remained at a similar level after that. The mean level of very low-density lipoprotein (15.5%) increased significantly after six months and continued to fall gradually over the subsequent 24 months of follow-up. Conclusions: A short-term, statistically significant, but scientifically unimportant deterioration of the lipid profile has been seen after LHRH agonist use as ADT for prostate cancer.

***Keywords*---**Androgen deprivation treatment, Prostate carcinoma, Lipid profile

Introduction

Prostate carcinoma is men's second most common cancer cell and the fifth most common cause of cancer-related mortality. The average age at medical diagnosis is sixty-six years [1]. Efficient, systematic therapy for prostate cancer has greatly increased the life duration of these patients and, in addition, patients with metastatic illness; the 5-year family member survival rate now exceeds 98% [2]. Androgen deprivation therapy (ADT) is one of the principal modalities for treating patients with the meta-fixed illness. It is also an adjuvant to radiation treatment in patients with locally advanced illnesses and those with unwanted intermediate-risk or high-risk local sicknesses. ADT's goal is hypogonadism, which can be achieved surgically with bilateral orchidectomy or therapeutically with luteinizing hormone-releasing hormone agonists (LHRHa)

or LHRH antagonists [3]. Nonetheless, ADT causes side effects such as libido loss, hot flashes, bone weakness, exhaustion, loss of lean body mass, anemia, gynecomastia, and progression of the metabolic condition [4, 5]. Several studies have documented changes in the lipid profile of men on ADT, although the results have been inconsistent. Many studies found a significant increase in triglyceride levels (by about 26%), total cholesterol (by approximately 10%), and high-density lipoprotein (HDL) levels (by approximately 8-10%) after 3, 6, and 12 months of ADT [6, 7]. A large population-based cohort study of 73,196 patients found that patients on LHRHa had a significantly increased risk of cardiac events; however, orchidectomy had no significant effect on the risk of heart events [8]. As a result, orchidectomy may be associated with fewer negative effects on various health and wellness domain names than long-term LHRHa use. Because dyslipidemia is directly related to morbidity and death in senior prostate cancer patients, this study aimed to analyze the effects of two commonly used ADT techniques on the lipid account in Indian patients with locally advanced and metastatic prostate carcinoma[8].

Methods:

This multi center study was conducted in LRH urology department From jan 2020 to jan 2021 study information from men diagnosed with prostate cancer We only included patients who satisfied the inclusion criteria in this retrospective study. Eligible participants had prostate cancer, ADT, and lipid data for the first two years of therapy. Those whom took lipid-lowering medications at the time ADT was initiated, or needed medication in addition to ADT for prostate cancer in the first two years. The patients were split into two groups. A Team: People who have had their testicles removed (orchiectomies). Group B: LHRH-agonist users (Triptorelin is the LHRH agonist recommended at our facility). After weighing the benefits and risks of each option, the client decided on bilateral orchiectomy. At baseline, 6, 12, and 24 months following ADT initiation, we collected each patient's diagnosis, treatment history, age, BMI, prostate-specific antigen (PSA), and lipid profile (cholesterol, triglycerides, HDL, LDL, and VLDL). We used SPSS version 22.0 to analyze data from an Excel file containing exam specifications (SPSS Inc., Chicago, IL). Fisher's exact test, one-way analysis

Of variance (ANOVA) and t-tests were used to analyze the quantitative data, with a significancelevel of p 0.05 being accepted.

Results

One hundred fifty-seven prostate cancer patients started ADT; 69 satisfied inclusion criteria and were randomized (A or B). 54 of 88 excluded people received lipid-lowering medications before ADT. In the first twoyears of ADT, 15 patients underwent chemotherapy, and 9 received abiraterone. Ten patients lacked first- two-year lipid account information. Two Team B clients utilized lipid-lowering treatment six months after starting ADT, but their data was omitted (Fig. 1). Table 1 compares teams. Team A and B had 8 and 9 prostatectomy or radiation patients. A and B started antiandrogens the day after bilateral orchidectomy or LHRHa (Bicalutamide 50 mg daily). One client from team A and three from team B received bicalutamide for lotion PSA.

Androgen deprivation lowered serum PSA for 24 months. In team A, all lipid account characteristics other than HDL cholesterol exhibited optimum wear and tear after six months (8.3, 7.7, 11.5, and 2.9% for total cholesterol, triglycerides, LDL, and VLDL cholesterol, respectively). 2. In group B (Table 3), total cholesterol, triglycerides, and LDL cholesterol climbed at six months (wear and tear from standard was 11.9%, 22.2%, and 21.1%), then returned to a near-normal level at one year and remained there until 24 months of follow-up. At six months, mean VLDL climbed 15.5%, then dropped until 24 months. Two years did not change HDL cholesterol.

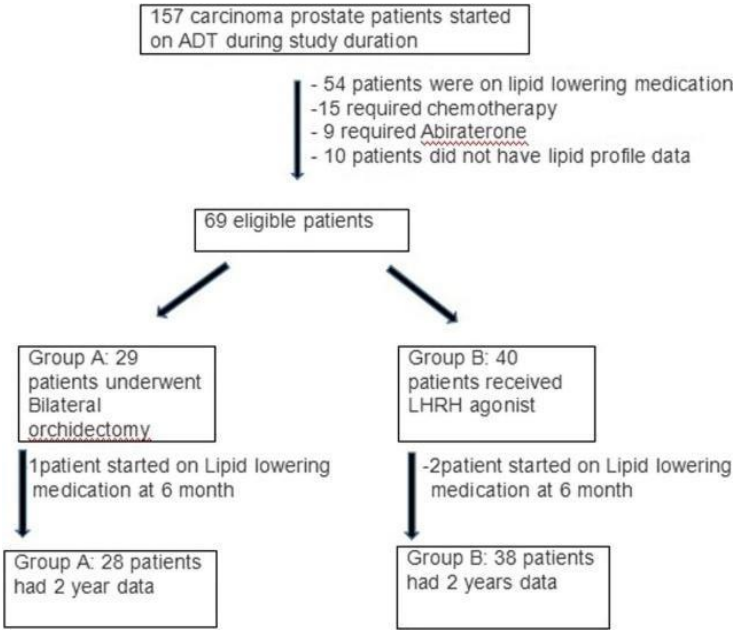

Table 1 Characteristics at the start of the study

Number	**29**	**40**	
Age (years)*	70.4±5.7	69.1 ± 5.9	**0.39**
BMI (kg/m²)*	22.8±3.4	22.8 ± 3	**0.71**
Diabetes	15	20	**1**
Hypertension	14	17	**0.82**
Serum PSA (ng/ml)*	55.4 ± 50.2	50.1 ± 45.3	**0.64**
Locally advanced/Metastatic	14/15	18/22	**0.81**
prostatecancer(as per EAU			
definitions)			
Gleason score*CAB	**8.1 ± 1.1** **23**	**8.2 ± 1.2** **34**	**0.48** **0.85**

Table 2 Lipid profiles of Group A patients who had orchid removal

	Baseline(A)	**6 month(B)**	**12 month(C)***	**24 month(D)***	***p* value**
Total cholesterol	180.6 ± 19.8	195.7 ± 28.3	189.4 ± 24.6	189.1 ± 24.5	**0.14**
Triglycerides	103.1 ± 29.8	111.1 ± 28.7	112.1 ± 29.2	112.5 ± 29.6	**0.57**
HDL-cholesterol	48.5 ± 7.9	50.5 ± 6.3	49.5 ± 6.4	48.9 ± 6.3	**0.70**

LDL-cholesterol	111.4 ± 19.4	124.3 ± 26.5	119.4 ± 22.7	119.8 ± 21.9	**0.19**
VLDL-cholesterol	**20.2 ± 3.8**	**20.8 ± 2.8**	**20.5 ± 2.7**	**20.6 ± 2.5**	**0.87**

**n = 28, data in mean SD; PSA prostate-specific antigen; HDL high-density lipoprotein; LDL low-density lipoprotein; VLDL very low-density lipoprotein.*

Table 3 Data on Group B lipoprotein profiles (LHRH agonist)

	Baseline(A)	**6 month(B)**	**12 month(C)***	**24 month(D)***	***p*-value**
Total cholesterol	173.1 ± 21.3	193.8 ± 32.4	171.5 ± 20.8	170.5 ± 21.1	< 0.0001
Triglycerides	109.1 ± 31.4	133.4 ± 31.3	114 ± 31.1	110.2 ± 31.6	< 0.001
HDL-cholesterol	49.2 ± 7.3	47.2 ± 7.3	47.4 ± 8.8	47.6 ± 9.4	0.69
LDL-cholesterol	103.9 ± 19.6	125.8 ± 28.9	103.1 ± 20.8	102.3 ± 22.3	< 0.0001
VLDL-cholesterol	20 ± 4.1	23.1 ± 5.1	21.9 ± 3.4	20.6 ± 4.1	0.006

PSA prostate-specific antigen, HDL high-density lipoprotein, LDL low-density lipoprotein, VLDL very low-density lipoprotein

*n = 38, data in mean ± SD

Discussion

Since ADT produces sudden andropause and metabolic alterations, it is used only to achieve a castrate testosterone level in the blood. These concerns must be addressed since not only is the number of people receiving ADT on the rise, but the average duration of treatment now exceeds ten years [9]. Several studies have shown that androgen deprivation therapy (ADT) alters men's lipid profiles, although the effects depend on the duration and intensity of treatment. A decrease in lipid quality was found to be statistically insignificant among individuals who had undergone orchidectomy. Similar shifts in TG, LDL, VLDL, and HDL cholesterol were observed by Moorjani et al. [10]. Researchers Ostergren et al. [11] discovered that fat mass and body weight increased more after orchidectomy than with LHRHa. Total cholesterol, LDL, and TG all increased significantly over a year.

In contrast, HDL increased for the first three months before significantly decreasing over the year (as found by Saglam et al.). Lipids were unaffected by LHRHa or orchidectomy [12]. Orchidectomy and lipid profiles have been studied inconsistently, which may be attributable to factors such as body mass index, sample size, dietary habits, and socioeconomic position.

The average levels of total cholesterol, triglycerides, and low-density lipoprotein (LDL) cholesterol rose dramatically after LHRHa treatment began, only to revert to pre-treatment levels after 12 months and remain stable for the next 24 months. The average VLDL level rose during the first six months, then fell over the next 24. During the trial, only the average HDL cholesterol level shifted noticeably. LHRHa was also shown to have similar effects in 33 men with locally advanced or metastatic prostate cancer by Salvador et al. They found a statistically significant rise in both total and low-density lipoprotein cholesterol [210-227 mg/dl (p 0.05)]. HDL and TG levels did not significantly alter at six months of follow-up, and after a year, all lipid parameters were back to baseline [13]. An increase in total cholesterol and LDL cholesterol was seen at three months in a trial of 39 patients taking LHRHa with or without bicalutamide [14]. This increase persisted fornine months for total cholesterol and a year for LDL.

Hormonal alterations may account for the divergent effects of orchidectomy and LHRHa on lipids, with elevated blood FSH, LH, testosterone, and estrogen following the former and decreased FSH, LH, and elevated estrogen following the latter. Anti-Mullerian hormone levels can be controlled with cream FSH [10, 15, 16]. Hormonal shifts have been linked to varying degrees of cardiac morbidity, although their effects have been found to vary widely between studies. Researchers Moor-Jani et al. [10]showed that LHRHa bonus flutamide was more effective than orchidectomy at reducing bad cholesterol and reversing heart disease. In contrast to orchidectomy, Sunlight et al. [15]found that gonadotropin-releasing agonist medication was associated with a statistically significant increase in cardiac incidents (p = 0.01). Clinical and medical castration were shown to have a relative risk of heart disease over ten years [16] by Thomsen et al. We did not find any new onset medical cardiac events in our investigation while finding a considerable but transient lipid account deterioration with LHRHa and no significant change with orchidectomy. This research can potentially change how hyperlipidemia is treated in individuals with prostate cancer who have had ADT. This study is limited by its small sample size. A bigger randomized trial is recommended to examine the effects of various ADT methods on lipidprofile and heart health[16].

Conclusions

When LHRH agonists were used as ADT for locally advanced and metastatic prostate cancer, therewas a statistically significant but scientifically insignificant short-term deterioration in the lipid account, with most lipid account parameters returning to the standard by the one-year follow-up. The lipid balance was not significantly affected by the surgical orchidectomy.

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