Take-Home Messages: Androgens

Anthony J. Bella MD, FRCSC
Greta and John Hansen Chair in Men’s Health Research
Division of Urology, Department of Surgery
University of Ottawa
SLAMS Symposium
  Clinical cases – Androgen Deficiency in the Aging Male
  ABEIS symposium – TRT in Brazil
Chinese Sexual Medicine Symposium
  Current Progress LOH
Sponsored Symposium – CV and T Abe Morgentaler
Basic Science
Workshop – Alternative management of hypogonadism
Master Lecture – Mario Maggi Increased CV Risk?
Podium Session 6 – Androgens (6)
Moderated Posters – Session 8 (10) and others (4)
SUMMARY

Instructional Course 5 – Patient Selection and Monitoring of TRT

Round Table 8 – How does prostate cancer risk affect TRT with presentations on:

- TRT after Radiation Therapy
- Why offer TRT after PCa treatment?
- When should TRT start?
- How monitor TRT patients?
- Is TRT safe in prostate health?

Unmoderated posters - 12
TESTOSTERONE AND CARDIOVASCULAR RISK
Cardiovascular risk associated with testosterone boosting medications: a meta-analysis of the available evidence
Cardiovascular risk associated with testosterone-boosting medications: a systematic review and meta-analysis

Giovanni Corona, Elisa Maseroli, Giulia Rastrelli, Andrea M Isidori, Alessandra Sforza, Edoardo Mannucci & Mario Maggi

University of Florence, Department of Experimental, Clinical and Biomedical Sciences, Sexual Medicine and Andrology Unit, Florence, Italy

Introduction: Recent reports have significantly halted the enthusiasm regarding androgen-boosting; suggesting that testosterone supplementation (TS) increases cardiovascular (CV) events.

Areas covered: In order to overcome some of the limitations of the current evidence, the authors performed an updated systematic review and meta-analysis of all placebo-controlled randomized clinical trials (RCTs) on the effect of TS on CV-related problems. Out of 2747 retrieved articles, 75 were analyzed, including 3016 and 2448 patients in TS and placebo groups, respectively, and a mean duration of 34 weeks. Our analyses, performed on the largest number of studies collected so far, indicate that TS is not related to any increase in CV risk, even when composite or single adverse events were considered. In RCTs performed in subjects with metabolic derangements a protective effect of TS on CV risk was observed.

Expert opinion: The present systematic review and meta-analysis does not support a causal role between TS and adverse CV events. Our results are in agreement with a large body of literature from the last 20 years supporting TS of hypogonadal men as a valuable strategy in improving a patient’s metabolic profile, reducing body fat and increasing lean muscle mass, which would ultimately reduce the risk of heart disease.

Keywords: cardiovascular risk, mortality, randomized clinical trial, testosterone

Primary end-point: major adverse cardiovascular events (MACE)
- cardiovascular death,
- non-fatal myocardial infarction
- stroke,
- acute coronary syndromes and/or heart failure reported as serious adverse events

Secondary end-points: all cardiovascular-related events
(anything reported as such by the authors):
- events reported as cardiac disorders,
- cardiovascular complaints,
- cardiovascular event
- vascular disorders, cardiac or cardiovascular
- event description fell within the International Statistical Classification of Disease (ICD) version 10 chapter IX (I00 to I99)
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### MACE

**Odds ratio for MACE**

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**Trial duration**

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**Source**

### MACE

**Odds ratio for MACE**

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<td>Elderly men</td>
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<td>2.73</td>
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Type of support

| Drug company not supported | 12     | 0.94  | 0.39  | 2.24  | 0.88|
| Drug company supported    | 14     | 1.07  | 0.51  | 2.24  | 0.86|

Trial duration

| ≤ 12 weeks | 4      | 1.02  | 0.20  | 5.29  | 0.98|
| >12 weeks  | 22     | 1.01  | 0.55  | 1.84  | 0.98|

MACE
Odds ratio for MACE

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<th>TS</th>
<th>Placebo</th>
<th># Events</th>
<th># Patients</th>
<th># Events</th>
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Associated conditions

Elderly men

Men with CVD

Frail men

Men with Metabolic disorders

Hypogonadism status

Mixed population

TT < 12 nM

Type of support

Drug company not supported

Drug company supported

Trial duration

≤ 12 weeks

>12 weeks

Odds ratio for MACE

Source |
---|
Associated diaseses |

Elderly men |

Men with CVD |

Frail men |

Men with Metabolic disorders |

Hypogonadism status |

Mixed population |

TT < 12 nM |

Type of support |

Drug company not supported |

Drug company supported |

Trial duration |

≤ 12 weeks |

>12 weeks |

# Events  # Patients  
Placebo  
TS  

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Does Testosterone Therapy increase CV Risks?

- TRT is not associated with *MACE* or *any cardiac event*
- TRT might decrease *MACE* and *any cardiac event* in MetS or T2DM
- TRT might increase *any cardiac event* (but not *MACE*) in frail men
TESTOSTERONE AND PROSTATE CANCER: ACTIVE SURVEILLANCE
Whereas most clinicians are familiar with the ethical concept “Primum non nocere,” or “First, do no harm,” all medical treatments entail some degree of risk, as does withholding treatment. A lesser known, but arguably more appropriate dictum for medical care is “Salus aegroti suprema lex,” or “Do what is best for the patient,” a concept that incorporates clinical judgment amid uncertainty, and honors the wishes and goals of the patient.
Whereas most clinicians are familiar with the ethical concept “Primum non nocere,” or “First, do no harm,” all medical treatments entail some degree of risk, as does withholding treatment. A lesser known, but arguably more appropriate dictum for medical care is “Salus aegroti suprema lex,” or “Do what is best for the patient,” a concept that incorporates clinical judgment amid uncertainty, and honors the wishes and goals of the patient.
Testosterone Replacement Therapy Following the Diagnosis of Prostate Cancer: Outcomes and Utilization Trends

Alan L. Kaplan, MD,* Quoc-Dien Trinh, MD,† Maxine Sun, PhD,‡ Stacey C. Carter, MD,* Paul L. Nguyen, MD,§ Ya-Chen Tina Shih, PhD,¶ Leonard S. Marks, MD,* and Jim C. Hu, MD, MPH*

*Department of Urology, David Geffen School of Medicine at UCLA, Los Angeles, CA, USA; †Center for Surgery and Public Health, Division of Urologic Surgery, Brigham and Women’s Hospital, Boston, MA, USA; ‡Cancer Prognostics Health Outcomes Unit, University of Montreal Health Centre, Montreal, QC, Canada; §Department of Radiation Oncology, Brigham and Women’s Hospital, Boston, MA, USA; ¶Section of Hospital Medicine, Department of Medicine Program in the Economics of Cancer, University of Chicago, Chicago, IL, USA

Methods. Using linked Surveillance, Epidemiology, and End Results-Medicare data, we identified 149,354 men diagnosed with prostate cancer from 1992 to 2007. Of those, 1,181 (0.79%) men received exogenous testosterone following their cancer diagnosis. We used propensity scoring analysis to examine the effect of testosterone replacement on the use of salvage hormone therapy and overall and prostate cancer-specific mortality.

Main Outcome Measures. We assessed overall mortality, cancer-specific mortality, and the use of salvage hormone therapy.

Results. Following prostate cancer diagnosis, testosterone replacement was directly related to income and educational status and inversely related to age (all $P < 0.001$). Men undergoing radical prostatectomy and men with well-differentiated tumors were more likely to receive testosterone (all $P < 0.001$). On adjusted analysis, testosterone replacement therapy was not associated with overall or cancer-specific mortality or with the use of salvage hormone therapy.

Conclusions. In this population-based observational study of testosterone replacement therapy in men with a history of prostate cancer, treatment was not associated with increased overall or cancer-specific mortality. These findings suggest testosterone replacement therapy may be considered in men with a history of prostate cancer, but confirmatory prospective studies are needed. Kaplan AL, Trinh QD, Sun M, Carter SC, Nguyen PL, Shih YCT, Marks LS, and Hu JC. Testosterone replacement therapy following the diagnosis of prostate cancer: Outcomes and utilization trends. J Sex Med 2014;11:1063–1070.
The relationship between total testosterone levels and prostate cancer: A review of the continuing controversy

Julia KLAP¹, Marianne SCHMID¹ and Kevin R. LOUGHLIN¹

¹Division of Urologic Surgery, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA

The risk of TRT for men with a history of PCa appears to be small, but appropriate regular monitoring of such patients is recommended.

The preponderance of studies examining the safety of exogenous testosterone administration in men with a history of PCa would suggest that there is little, if any risk, in such a circumstance. However, the risk has not been proven to be zero, so the most prudent course is to follow such men with regular PSAs and digital rectal exams.
Testosterone Supplementation Therapy in Men Undergoing Active Surveillance for Prostate Cancer

Boback M Berookhim MD MBA, Rahul Krishnan BS, Christian J Nelson PhD, John P Mulhall MD MSc FECSM FACS

Memorial Sloan-Kettering Cancer Center
Sexual & Reproductive Medicine Program
Urology Service
NY, USA
Objective

To report our experience with testosterone supplementation therapy in men undergoing active surveillance for prostate cancer
Methods

• Retrospective review of prospectively gathered data through CAISIS

• Patients with a diagnosis of prostate cancer in the active surveillance program visiting a single urologist specializing in andrology (JPM)

• All patients had symptoms of TDS and low to borderline total testosterone levels (300 ng/dL)
Methods

• After extensive discussion, all patients offered TRT with either:
  - Clomiphene Citrate
  - Transdermal testosterone
  - Intramuscular testosterone

• Patient underwent repeat prostate biopsy and prostate MRI every 12-18 months after enrollment
## Results

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<td>17</td>
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<tr>
<td>Mean age at start of TRT</td>
<td>62±11 years</td>
</tr>
<tr>
<td>Median Gleason Score</td>
<td>3+3 (one 3+4 patient)</td>
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<tr>
<td>Mean follow up</td>
<td>32 months</td>
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<tr>
<td>Median number of repeat biopsies</td>
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<td>Median number of repeat MRI studies</td>
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<td>Transdermal Testosterone</td>
<td>9 patients</td>
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<tr>
<td>Intramuscular Testosterone</td>
<td>2 patients</td>
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Results

BEFORE TRT

• Mean total testosterone
  - 237±167 ng/dl

• Mean PSA
  - 3.7±1.2 ng/ml

AFTER TRT

• Mean total testosterone
  - 603±223 ng/dl

• Mean PSA
  - 5.6±1.1 ng/ml

- 5 patients’ PSA decreased >1 ng/ml
Results

• No patient had grade progression on repeat prostate biopsy
• No patient had stage progression based on repeat MRI
• There were no imperative indications for discontinuation of TST during study follow up
• 2 patients discontinued TRT
  - 1 from advice of outside physician
  - 1 due to patient anxiety
Conclusions

• Testosterone supplementation therapy appears to be safe in a very small cohort of well selected active surveillance patients with a short-term follow up

• Safety of testosterone supplementation in men with untreated prostate cancer requires further study with much larger cohorts of patients and longer term analysis
MONITORING THE PROSTATE CANCER PATIENT TREATED WITH TESTOSTERONE
serum hormone, PSA, Hgb and Hct levels were assessed within 3 months of RP, and sequentially every 3 to 6 months after TRT initiation.
Testosterone Replacement Therapy in Patients with Prostate Cancer After Radical Prostatectomy

Alexander W. Pastuszak,* Amy M. Pearlman,* Win Shun Lai,* Guilherme Godoy,* Kumaran Sathyamoorthy,* Joceline S. Liu,* Brian J. Miles,* Larry I. Lipshultz† and Mohit Khera‡,§

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While a statistically significant increase in PSA was observed in the high risk and nonhigh risk treatment groups, this increase was not supportive of CaP recurrence, with PSAV being lower than an expected PSAV of 0.30 to 0.43 ng/ml per year in hypogonadal men without prostate cancer on TRT, and lower than in men after RP with BCR, in whom PSAV may be between 0.11 and 0.25 ng/ml per month.17,23,24
CONCLUSIONS

In hypogonadal men with a history of prostate cancer after RP, TRT results in increases in serum T levels, with a small but significant rise in PSA and a lower BCR rate in treated men compared with age matched reference men without symptomatic evidence of hypogonadism, even in men with a history of CaP bearing high risk features. However, given the retrospective nature of this and prior studies, TRT in men with a history of CaP should be performed with a vigorous surveillance protocol. Furthermore, the global experience with TRT in the setting of CaP remains limited, with fewer than 600 patients evaluated and treated in disparate ways.
CONCLUSIONS

In hypogonadal men with a history of prostate cancer after RP, TRT results in increases in serum T levels, with a small but significant rise in PSA and a lower BCR rate in treated men compared with age matched reference men without symptomatic evidence of hypogonadism, even in men with a history of CaP bearing high risk features. However, given the retrospective nature of this and prior studies, TRT in men with a history of CaP should be performed with a **vigorous surveillance protocol**. Furthermore, the global experience with TRT in the setting of CaP remains limited, with fewer than 600 patients evaluated and treated in disparate ways.
ACTIVE SURVEILLANCE AND TREATMENT WITH TESTOSTERONE
Testosterone Therapy in Men With Untreated Prostate Cancer

Abraham Morgentaler,* † Larry I. Lipshultz,‡ Richard Bennett,§ Michael Sweeney,§ Desiderio Avila, Jr.§ and Mohit Khera||

From Men’s Health Boston, Division of Urology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts (AM, MS), and the Department of Urology, Baylor Medical College, Houston, Texas (LIL, RB, DA, MK)

Surveillance consisted of PSA and digital rectal examination of the prostate at 3-month intervals, and followup prostate biopsy at yearly intervals. Biopsy results were based on reports generated by the Pathology staff at Beth Israel Deaconess Medical Center in Boston, Massachusetts, and at Baylor Medical College in Houston, Texas.
had transrectal ultrasound-guided prostate biopsy performed on April 3, 2014 and returns today accompanied by his spouse to discuss the results. He had no problems with the biopsy and no complications.

The ultrasound showed a 21 cc prostate with a PSA density in the low range of 0.09. The pathology showed no significant changes here. The right mid medial core showed less than 5% involvement with Gleason 6 prostate cancer. The rest of the cores were negative.

I have explained that this gives us further support for the active surveillance approach. He is strongly in support of this strategy. I have outlined our current active surveillance protocol to him. I will be seeing him back in a 6 monthly basis and we will start with the 1st visit in 6 months with a repeat PSA.

- Symptomatic hypogonadism......treat or not treat?
• Symptomatic hypogonadism......treat.
• How to follow if decide to treat?
• There is no consensus on “careful monitoring” of our patients

• There are no specific differentiators for “vigorous surveillance protocol”

• We use 1,1,1 then 3,3 then 6 month intervals including PSA, measure of T levels, and HCT/HGb
The testosterone supplementation therapy has brought his total testosterone from 4.4, which is hypogonadal to 19.2. This is in a safe therapeutic range, within normal limits. He is seeing symptomatic improvement.

PSA was 1.88 in January 2014. It is now 1.50.

We will continue to monitor appropriately, this patient who is on active surveillance for his prostate cancer under Dr. [ redacted ] and under my care for his hypogonadism.

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- To come off TST/TRT – increase in Gleason score or concerning rise in PSA (no clear guide here)
Take-Home Messages: Androgens

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