Plasma Leptin Is Not Associated with Prostate Cancer Risk

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Introduction

Leptin, the adipocyte-produced hormone, has been shown to induce angiogenesis and proliferation in several tissues, and leptin receptors have been demonstrated in the prostate (1, 2). Circulating levels of leptin are strongly related to the amount of adipose tissue and androgenicity (1, 3). We hypothesized that leptin may provide a link between a Western lifestyle often resulting in excess weight, and prostate cancer. In a previous prospective study in The Northern Sweden Health and Disease Cohort, we found a significantly increased risk of prostate cancer up to a relative risk of 2.4 for intermediately elevated levels of plasma leptin (2). The aim of the present study was to investigate the consistency of our previous finding in a different study population while taking putative hormonal confounders into consideration.

Materials and Methods

In a longitudinal study, we used prediagnostic serum samples from 200 cases of prostate cancer and 397 controls in the Janus Project in Norway, for which the procedure for recruitment and blood collection have been described in detail previously (4). Cases, diagnosed at the earliest 3 months after blood collection, were identified through linkage with the Cancer Registry. Two controls were randomly selected from sets matched to the index case on age ( ± 1 year) and date ( ± 6 months) at blood sampling and on county. The study was approved by the Research Ethics Committee of Umeå University Hospital.

Leptin was determined with a double antibody radiomuunoassay (Linco Res., St. Louis, MO). Intrabatch coefficients of variation were between 3–5%, and interassay coefficient of variation were between 3–5%, and interassay coefficient of variation were between 3–5%. Testosterone and estradiol were quantitated by a time-resolved fluoroimmunoassay (DELFIA; Wallac, Turku, Finland). SHBG3 was quantitated by fluorimmunoassay (AutoDELFIA; Wallac, Turku, Finland).

Results

The mean age of the subjects at blood collection was 49 years (SD, 7.3), and the mean time between blood collection and diagnosis was 17 years (SD, 5.5). There were weak but significant correlations between leptin and testosterone (r = −0.11; P = 0.007), and SHBG (r = −0.09; P = 0.02) but not estradiol (r = −0.05; P = 0.2). No significant association between plasma leptin levels and prostate cancer risk was found, either in the whole study group or in strata of age or follow-up time (Table 1). Adjustments for testosterone, estradiol, and SHBG, separately or combined, did not affect the odds ratio estimates.

Discussion

Prostate cancer risk was slightly increased for younger men with the highest levels of leptin and for men with the longest follow-up time. However, at variance with our earlier finding (2), but in accordance with a recent case-control study (5), we found no support for the hypothesis that elevated levels of leptin may provide a link between a Western lifestyle often resulting in excess weight, and prostate cancer. In a previous study on age (49 years).

Table 1  Odds ratios with (95% CI) of prostate cancer by quartiles of serum leptin

<table>
<thead>
<tr>
<th>Quartiles</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leptin unadjusted</td>
<td>1.00 (ref)</td>
<td>1.0 (0.6–1.6)</td>
<td>0.7 (0.4–1.1)</td>
<td>0.9 (0.6–1.6)</td>
</tr>
<tr>
<td>Leptin adjusted&lt;sup&gt;4&lt;/sup&gt;</td>
<td>1.00 (ref)</td>
<td>1.0 (0.6–1.7)</td>
<td>0.7 (0.4–1.1)</td>
<td>0.9 (0.6–1.6)</td>
</tr>
<tr>
<td>Age &lt; median&lt;sup&gt;5&lt;/sup&gt;</td>
<td>1.00 (ref)</td>
<td>1.4 (0.7–2.6)</td>
<td>0.8 (0.4–1.7)</td>
<td>1.4 (0.7–2.7)</td>
</tr>
<tr>
<td>Age ≥ median</td>
<td>1.00 (ref)</td>
<td>0.7 (0.3–1.4)</td>
<td>0.5 (0.2–1.1)</td>
<td>0.7 (0.3–1.3)</td>
</tr>
<tr>
<td>F-U &lt; median&lt;sup&gt;5&lt;/sup&gt;</td>
<td>1.00 (ref)</td>
<td>0.7 (0.3–1.5)</td>
<td>0.8 (0.4–1.5)</td>
<td>0.7 (0.4–1.4)</td>
</tr>
<tr>
<td>F-U ≥ median</td>
<td>1.00</td>
<td>1.4 (0.7–2.6)</td>
<td>0.5 (0.2–1.1)</td>
<td>1.2 (0.6–2.4)</td>
</tr>
</tbody>
</table>

<sup>4</sup> Adjusted for serum levels of testosterone, estradiol, and SHBG.
<sup>5</sup> Subgroup analysis in two groups according to age. The cut-point was the median age at the time of blood collection (49 years).

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circulating leptin are associated with overall increased risk of prostate cancer.

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References
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