Analysis of Metabolic Syndrome as a Modifiable Risk Factor for Prostate Cancer

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Prostate cancer and metabolic syndrome are both prevalent among men in developed countries with peak incidence after age 50.

Prostate cancer has no known modifiable risk factors. Most risk factors for metabolic syndrome are modifiable. If metabolic syndrome is identified as contributing to the risk of prostate cancer it would give an element of self determination to men at risk for prostate cancer.

Past studies provide conflicting results in the correlation between these two conditions.

A literature review was performed to evaluate consistencies in current literature.

Metabolic syndrome or its components do not increase the risk of developing overall prostate cancer.

Metabolic syndrome does increase mortality from prostate cancer.

Men with metabolic syndrome are found to have higher grades of disease upon diagnosis of prostate cancer.

Risk factors for prostate cancer include:

- Age
- Race

Metabolic syndrome specifically including hypertension

The Prostate, 71

Metabolic syndrome has been proven modifiable through lifestyle modification while Prostate Cancer is unavoidable.

Providers should be mindful that men with metabolic conditions should be mindful of the importance of preventative medicine.

Most risk factors for metabolic syndrome are modifiable.

Hypertension, Blood pressure measurement while others use a prescription of antihypertensive medication to define it.

The strongest evidence available indicates no positive correlation between metabolic syndrome as a whole and overall prostate cancer.

Studies investigating individual components of metabolic syndrome increase the risk of prostate cancer have weaknesses which undermine their results, coupled with weak statistical correlations.

Good quality evidence supports a correlation between the number of metabolic components a man has and the grade of prostate cancer he has upon diagnosis.

This is further supported by strong evidence for increased mortality from prostate cancer among men with metabolic syndrome or components.

Further analysis is needed to investigate the degree to which diabetes is protective against prostate cancer.

Risk factors for metabolic syndrome include:

- High fat low fiber diet and sedentary lifestyle among others.
- Above normal weight
- Above normal serum triglyceride levels
- Above normal serum glucose levels
- Below normal serum HDL
- Elevated blood pressure
- Above normal weight

Most risk factors for metabolic syndrome are modifiable.

With metabolic syndrome or components do not increase the risk of developing overall prostate cancer.

If metabolic syndrome is identified as contributing to the risk of prostate cancer it would give an element of self determination to men at risk for prostate cancer.

It is important to note that while metabolic syndrome does increase mortality from prostate cancer, it is not a direct cause of prostate cancer.

The relationship between metabolic syndrome components and both overall prostate cancer and death from prostate cancer.

Model 1 Corrected for random error using the regression dilution ratio.

Model 2 corrected for random error using regression calibration.

Composite score is as compilation of the z scores calculated for each individual component.

Introduction

Risk factors for prostate cancer include only:

- Age
- Race

High fat low fiber diet and sedentary lifestyle among others.

Above normal weight

Above normal serum triglyceride levels

Above normal serum glucose levels

Below normal serum HDL

Elevated blood pressure

Above normal weight

Most risk factors for metabolic syndrome are modifiable.

Most risk factors for metabolic syndrome are modifiable.

Most risk factors for metabolic syndrome are modifiable.

Metabolic syndrome is defined as having 3 of 5 abnormal: Triglycerides, serum glucose, HDL, blood pressure and weight.

Abstract

• Are men with a diagnosis of metabolic syndrome at increased risk for developing prostate cancer compared to men without?

• Prostate cancer is defined as overall cases.

• No differentiation is made between high and low grade cancer based of Gleason score or presence of symptoms.

• Do any of the individual components of metabolic syndrome increase the risk for developing prostate cancer?

• Metabolic syndrome components include:

  - Normal serum triglyceride levels
  - Normal serum glucose levels
  - Normal HDL
  - Normal blood pressure
  - Normal weight

Research Question

• Metabolic syndrome does not increase the risk of developing prostate cancer (Wallner, 2010).

• No individual components of metabolic syndrome or any composite grouping of them increase the risk of prostate cancer, increased mortality found (Haggstrom, 2012).

• Metabolic syndrome specifically including hypertension increased the risk of prostate cancer. Hypertension alone does not increase risk, metabolic syndrome without hypertension does not increase risk (Radausauskas, 2016).

• Hypertension does increase the risk of overall prostate cancer (Liang, 2016).

• Men with metabolic syndrome have greater risk of high grade prostate cancer than those without (Zhang, 2015)

• No individual component of metabolic syndrome increases the risk of prostate cancer (Bhindari, 2014).

• Men with metabolic syndrome have higher grades of disease upon prostate biopsy (De Nunzio, 2011).

• One metabolic syndrome component was protective against prostate cancer, 2 or more components were associated with higher grades of cancer on diagnosis (Sourbeur, 2014).

Discussion

• Due to inconsistencies in the definition of metabolic syndrome, cross study comparisons must be qualitative which leads to inaccuracies.

• For example one study will classify hypertension by blood pressure measurement while others use a prescription of antihypertensive medication to define it.

• The strongest evidence available indicates no positive correlation between metabolic syndrome as a whole and overall prostate cancer.

• Studies investigating individual components of metabolic syndrome increase the risk of prostate cancer have weaknesses which undermine their results, coupled with weak statistical correlations.

• Good quality evidence supports a correlation between the number of metabolic components a man has and the grade of prostate cancer he has upon diagnosis.

• This is further supported by strong evidence for increased mortality from prostate cancer among men with metabolic syndrome or components.

• Further analysis is needed to investigate the degree to which diabetes is protective against prostate cancer.

Results

• This figure is a graphical representation of the relationship between metabolic syndrome components and both overall prostate cancer and death from prostate cancer.

• Model 1 Corrected for random error using the regression dilution ratio.

• Model 2 corrected for random error using regression calibration.

• Composite score is as compilation of the z scores calculated for each individual component.

References


Applicability to Clinical Practice

• Practitioners should not alter their practice from established guidelines to screen for prostate cancer in the presence of metabolic conditions.

• Current prostate cancer screening guidelines.

• American College of Physicians

  • Shared decision making age 50-60 with >15 years of life expectancy.

• American Cancer Society

  • Shared Decision Making at age 50 for men of average risk.

• Providers should be mindful that men with metabolic disorders will likely have more advanced prostate cancer when diagnosed than men without.

• Be mindful of the importance of preventative medicine when caring for patients with complex medical histories.

• Prostate cancer screening requires shared decision making. Knowledge of advanced disease should be part of the conversation about screening.

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