

Socioeconomic Variation and Prostate Specific Antigen Testing in the Community: A United Kingdom Based Population Study

Rhian M. Morgan, Robert J. C. Steele, Ghulam Nabi and Colin McCowan*

From the Division of Population Health Sciences, Medical Research Institute, University of Dundee, Dundee and Robertson Centre for Biostatistics, Institute of Health and Wellbeing, University of Glasgow (CM), Glasgow, Scotland, United Kingdom

Purpose: We examined the association of prostate specific antigen testing with prostate cancer incidence, tumor differentiation and mortality according to socioeconomic status.

Materials and Methods: Participants were 96,484 men between 40 and 99 years old without preexisting prostate cancer who were registered with a general practitioner in the Tayside region of Scotland, United Kingdom, between January 1, 2003 and December 31, 2008. We performed a retrospective cohort analysis using anonymized health data, including biochemistry data on prostate specific antigen tests, Scottish Index of Multiple Deprivation, cancer registry data set and General Register Office for Scotland death records. Main outcome measures were prostate specific antigen testing, prostate cancer incidence and death.

Results: Men in the most affluent Scottish Index of Multiple Deprivation quintile had a greater chance of undergoing a prostate specific antigen test (OR 1.48, 95% CI 1.40–1.57, $p < 0.001$) and having prostate cancer (OR 1.48, 95% CI 1.15–1.91, $p = 0.002$) than men in the most deprived quintile, adjusting for age. There was no association between deprivation index quintile and prostate cancer death.

Conclusions: Increased affluence was associated with a higher likelihood of a prostate specific antigen test and a higher incidence of prostate cancer. However, there were no observed differences by social class of the likelihood of a positive prostate specific antigen test or prostate cancer related death.

Key Words: prostate, prostate-specific antigen, prostatic neoplasms, mortality, social class

Abbreviations and Acronyms

GP = general practitioner
PSA = prostate specific antigen
SES = socioeconomic status
SIMD = Scottish Index of Multiple Deprivation

Accepted for publication April 12, 2013.

Study received approval from the Tayside Committee on Medical Research Ethics, National Health Service Tayside Caldicott Guardian and NHS Tayside Research and Development Office.

* Correspondence: Robertson Centre for Biostatistics, Institute of Health and Wellbeing, College of Medical, Veterinary and Life Sciences, University of Glasgow, Boyd Orr Building, Level 11, Glasgow, G12 8QQ, Scotland, United Kingdom (telephone: +44(0)141 330 3319; FAX: 44(0)141 330 5094; e-mail: Colin.McCowan@glasgow.ac.uk).

For another article on a related topic see page 1410.

In the last 25 years there has been a significant increase in the incidence of prostate cancer.¹ The incidence doubled in Scotland between 1985 and 2009, making it the most common non-cutaneous cancer in men.^{2,3} Increased PSA testing may be partly responsible for this increased incidence.^{4–8}

Several groups reported an increased incidence of prostate cancer in more affluent areas compared with more deprived areas,^{7,9–11} in contrast to most other cancers. Breast cancer

is the exception, which has a higher incidence in more affluent women. This may in part be explained by higher attendance for breast cancer screening than more deprived women and the subsequent introduction of a detection bias for these groups.^{7,12,13}

The similar incidence pattern of prostate cancer in men may also be as a result of increased testing in more affluent groups. A retrospective study in England examined PSA tests performed by GPs in 10,695 men older

than 45 years.¹⁴ Increasing social deprivation was associated with a decreased likelihood of PSA testing but there was no relationship between deprivation and a positive test. Reasons suggested for the increased testing rate included increased patient demand due to heightened awareness of the disease and greater awareness of prostate cancer in GPs in more affluent areas.¹⁴

Less is known about disease stage or tumor grade at diagnosis and its relationship with deprivation. A study showed that higher SES was associated with earlier cancer stages at diagnosis.⁹ Others reported that men from less affluent areas were less likely to have screening detected cancer but more advanced disease at diagnosis and they were at increased risk for death.¹¹ An early systematic review mentioned inconsistent survival results according to SES but suggested that earlier diagnosis in more affluent men may be responsible for better prognosis.¹² Comparing prostate cancer deaths in Scotland between 2010 and 1985 showed that the age standardized mortality rate increased marginally from 22% to 22.7% despite an increase in patient numbers (849 vs 538) with no difference by SES.^{7,15}

We examined the relationship of PSA testing with the prostate cancer incidence, grade at diagnosis, mortality and SES in a fixed population of men.

METHODS

Data

Collection. The Health Informatics Centre provides access to a number of health related population based data sets of approximately 400,000 individuals registered with a GP in the Tayside area of Scotland.¹⁶ Health care is free at the point of care and tax payer funded. A single health board is responsible for providing specialist and hospital care, which contracts primary medical care services out to approximately 70 general practices. There is no PSA screening in the service. Using the community health index number, a unique 10-digit identifier, data on all routine National Health Service (NHS) encounters can be linked to other data sets, including death certificate records. All personal identifiers are removed from the data and only an anonymized extract is created for subsequent analysis.

We retrospectively examined the records of all men older than 40 years residing in Tayside, Scotland, between January 1, 2003 and December 31, 2008 or until death, whichever was earlier. Extracted data included anonymized date of birth, SIMD deprivation quintile,¹⁷ PSA test dates and results, date of prostate cancer incidence from cancer registry records, including histological and clinical diagnoses, and the date and cause of death according to the General Register Office for Scotland.

Analysis. All 1,002 patients previously diagnosed with prostate cancer before the study were excluded, as were

48 who were 99 years old or older and 296 with no SIMD category available. PSA test results were marked positive using age related referral values for total PSA, including 2.5 ng/ml or greater for ages 40 to 49, 3.0 ng/ml or greater for 50 to 59, 4.0 ng/ml or greater for 60 to 69 and 5.0 ng/ml or greater for 70 years or greater.^{14,18} The number of tests per patient and the number of positive tests were recorded. Patients were subsequently classified as ever having undergone a test or ever having a positive test.

SIMD based on the patient full postal code was categorized into quintiles with the highest corresponding to the most affluent code. SIMD combines 38 indicators across 7 domains, including income, employment, health, education, skills and training, housing, geographic access and crime.¹⁷ Tumor differentiation grade according to Gleason score was extracted from cancer registry records and classified as low grade—6 or less, intermediate—7 and high—8 to 10.^{18,19}

We examined the method of first detecting prostate cancer, as recorded in cancer registry records. This was grouped as 1) incidental finding after another examination or surgery for unrelated reasons, 2) clinical presentation with relevant lower urinary tract symptoms, 3) previously unsuspected incidental finding at autopsy and 4) unknown.

Statistical Analysis

Data are shown as the number of subjects and percent for all categorical variables with the results of the chi-square test for trend (chi-square trend, df and p value) or the Fisher exact test (chi-square, df and p value) reported, as appropriate. We used logistic regression analysis to estimate the OR and 95% CI of undergoing a PSA test, having a positive PSA test, having prostate cancer and dying of prostate cancer during the study period, unadjusted and adjusted for all covariates. All data were analyzed using SPSS®, version 18.0.

Ethical and Research Approval

Approval was granted by the Tayside Committee on Medical Research Ethics and the NHS Tayside Caldicott Guardian according to prior arrangements, and by the NHS Tayside Research and Development Office.

RESULTS

Of the 96,484 men registered with a GP and residing in Tayside 19,233 (19.9%) underwent at least 1 PSA test with a significantly higher proportion in the most affluent group compared to the most deprived group (23% vs 17%, chi-square trend 198.873, 1 df, $p < 0.001$, table 1). Increasing age was associated with a PSA test, increasing from 6.7% at ages 40 to 49 years to 17.1% at 50 to 59, 28.8% at 60 to 69 and 34.8% at 70 years or greater (chi-square trend 7,092.578, 1 df, $p < 0.001$).

More affluent men were more likely to undergo multiple PSA tests (39% vs 29%, chi-square trend 105.848, 1 df, $p < 0.001$) and, of those tested, to have a positive test (27% vs 24%, chi-square trend 79.940, 1 df, $p < 0.001$, table 1).

Download English Version:

<https://daneshyari.com/en/article/3864131>

Download Persian Version:

<https://daneshyari.com/article/3864131>

[Daneshyari.com](https://daneshyari.com)