

RESULTS

Response rates to the questionnaire for cases and controls were 83 and 70%, respectively. The general characteristics of the study population are shown in Table 1. The median age of advanced cases is higher than that of the controls (62 compared with 57). Subjects with past smoking history appeared to show a small increase in risk compared with non-smokers (OR 1.20, 95% CI 1.03–1.39). Social class, education and marital status were not associated with prostate cancer risk (all CIs include 1). More than 90% of subjects were Caucasian.

Table 2 shows risk estimates for fingers reported to be of approximately equal length and index finger longer than ring finger length and as compared with index shorter than ring finger pattern; the latter reported pattern showing a statistically significant decreased prostate cancer risk with an OR of 0.67; 95% CI 0.57–0.80.

DISCUSSION

The study was a large case–control study with data collected over a period of 15 years, with similar rates of cases and controls recruitment. The subjects were asked to self-identify their pattern of index (2D) as compared to ring finger (4D). The results showed a negative association between length of 2D greater than 4D and prostate cancer risk (OR 0.67, 95% CI 0.57–0.80) in all ages and at ages < 60 (OR 0.13, 95% CI 0.09–0.21) (results not shown). These negative associations suggest that lower prenatal activity of testosterone is protective against prostate cancer later in life.

The only study to investigate the relationship

than the left hand (Williams *et al*, 2000). A high 2D:4D ratio in male right hands was associated with germ cell failure due to azoospermia or oligospermia with no motility; furthermore, testosterone assays from 58 male subjects were negatively associated with 2D:4D ratio in the right hand ($P=0.03$), which was not seen in the left hand (Manning *et al*, 2000). Twin studies suggest that there is also a possible genetic role in addition to any prenatal environmental influence on this hormonally related skeletal ratio in both men and women (Paul *et al*, 2006; Gobrogge *et al*, 2008).

A protective effect of a high 2D:4D hand pattern on prostate cancer risk was observed. High 2D:4D hand pattern may be the marker of low prenatal androgenic activity, suggesting the importance of hormone modulation in *utero* on prostate cancer risk. Hand pattern might represent a simple marker for prostate cancer risk, particularly in men age under 60 years.

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Author contributions

AA Rahman was involved in conduct of the study, analysing the data and drafting the paper; A Lophatananon was involved in conduct of the study, analysing the data and revising the drafted paper. SS Brown was involved in analysing the data, drafting the paper and approving the final draft. D Harris and J Anderson were involved in set-up of the data collection, approving the study design and revising the final draft. T Parker was involved in revising both the drafted paper and the final draft. D Easton, R Pocock, D Dearnaley, M Guy, Z Kote-Jarai, L O'Brien, RA Wilkinson, AL Hall, E Sawyer, E Page and J-F Liu were involved in development of the protocol, conduct of the study and revision of the paper. R Eeles and K Muir were involved in development of the protocol, conduct of the study, revision of the paper, and were principal investigators and guarantors of this study.

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