

A LONGITUDINAL NON-INVASIVE STUDY OF CHANGES IN URINARY BLADDER CONTRACTILITY SECONDARY TO BENIGN PROSTATIC HYPERPLASIA: EPIDEMIOLOGICAL ASPECTS

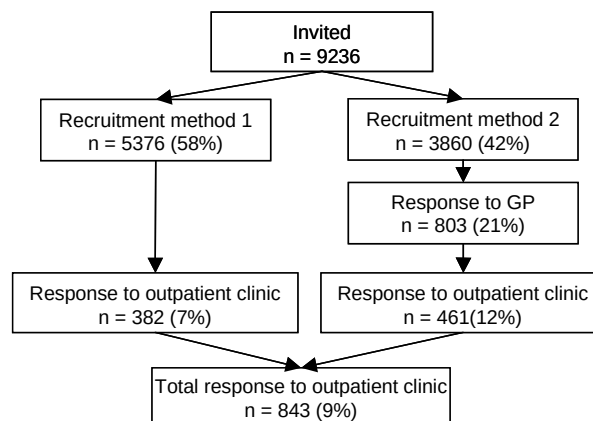
Hypothesis / aims of study

With increasing age, the prostate enlarges: benign prostatic hyperplasia (BPH). In response to the increasing resistance to urinary flow, the urinary bladder function changes. We study this, longitudinally in healthy males using a non-invasive method of measuring the urinary bladder pressure, with an external catheter based on an incontinence condom [1,2,3]. 8 age stratified cohorts of five years in the range of 38-77 years, consisting of approximately 120 volunteers each were recruited by general practitioners and will be studied three times in five years. The first of the three evaluations has been completed.

We have used different recruitment systems. Originally, volunteers were recruited by letter from their general practitioner, asking them to make an appointment with our outpatient clinic (recruitment method 1). Later, patients of GP's were asked to visit the GP's practice first for an anamnesis and transabdominal ultrasound examination of the prostate. During this visit they were invited for a complete investigation at the outpatient clinic (method 2). Investigators in most community studies have not considered non-response bias; it is not known whether the study population is truly representative. The age distribution and non-response bias could have a large influence on the measured parameters. We have studied and report here differences between responders and non-responders in our study, differences between responders at the GP's ("GP-response") and at the clinic ("full response"), and factors influencing the response rates.

Study design, materials and methods

We included baseline demographic characteristics of all subjects invited by 20 GP's (n=9236), and subdivided these into responders and non-responders. The flowchart shows the numbers of subjects in each recruitment method.



The subject's GP was included as a potentially relevant explanatory factor. From an official registry a socio-economic continuous rank score, ranging from 1 (low) to 4000 (high), was obtained and matched to the subjects by postal code.

First, crude differences in the socio-economic status, the age, the recruitment method and the subject's GP between responders and non-responders were assessed. Also the mutual relationships between these variables were considered. Next, we used multiple logistic regression analysis in order to relate the response simultaneously to these variables.

Results

Each explanatory variable (recruitment method, GP, age group and socio-economic score) had a highly significant relationship with response (GP-responders as well as full responders). As recruitment method 2 was exclusively used by some GP's only, these variables were by definition related. Hence, they were not used together in the multiple logistic regression analysis.

GP-response

In a multiple logistic regression analysis using GP-response (1185/9236) as outcome variable the significant explanatory variables were: GP or recruitment method, age group, socio-economic score and the interaction between age group and socio-economic score. No other significant interactions were found.

The OR of the GP with the highest response to the GP with the lowest response was 6.7 (95 % CI: 3.7-12). The effect of age group on the GP-response rate, given an average level for socio-economic score and given the lowest age group as reference, rose to 3.3 (95 % CI: 2.5-4.2) around the age of 65 and then decreased again to 1.7 (95 % CI: 1.2-2.4) in the highest age group.

The effect of socio-economic score as it depended on age was given by an OR per 1000 points higher socio-economic score of around 1.3 in the lowest age group to 0.9 in the highest age groups.

Full response

In a multiple logistic regression analysis using full response (843/9236) as outcome variable the significant explanatory variables were the same, but no significant interactions were found.

Recruitment method 2 led to a higher full response than method 1: OR was 1.7 (95 % CI: 1.5-2.0). If GP rather than recruitment method was entered in the model the OR of the GP with the highest response to the GP with the lowest response was 3.6 (95 % CI: 2.1-6.2). The effect of age group and socio-economic score were similar to those in the GP-response group.

Interpretation of results

Response depended strongly on the subject's GP, and/or on the recruitment method: these effects we could not properly distinguish. It was highest at the age of 65 and it increased with socio-economic status. This latter effect is less strong for the GP-response in the older age groups.

Concluding message

The results of this study provide important information on factors influencing response rates in males invited to participate in a longitudinal urodynamic study. This may be helpful in designing future longitudinal urodynamic studies. Our present study had a low average response (843/9236=9%), which makes it necessary to properly correct them for non-response bias when generalizing the conclusions to the male target population.

References:

1. Applicability and reproducibility of the condom catheter method for measuring the isovolumetric bladder pressure. *Urology* 63: 56-60 (2004)
2. The variable outflow resistance catheter: anew method to measure bladder pressure noninvasively. *J.Urol.* 165: 647-652 (2001)
3. Non-invasive measurement of bladder pressure using an external catheter. *Neurourological Urology*. 18(5): 455-475 (1999)

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