

# Could Overactive Bladder be a Progressive Disease? — Review of Longitudinal Epidemiologic Studies

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## THE DEFINITION OF OAB IS THE MAJOR VARIANT IN EPIDEMIOLOGIC SURVEY

Overactive bladder (OAB) is a common syndrome affecting both women and men in clinical practice, and it often compromises quality of life. Several epidemiologic studies had evaluated the prevalence or incidence of OAB among different races and in different geographic locations. However the use of different definitions of OAB in these studies may lead to different results, which makes comparisons difficult [1]. The original definition of OAB refers to the storage phase in the bladder and should be diagnosed by urodynamic study only. Typical finding in cystometry study includes involuntary detrusor contractions during the storage phase, which may occur spontaneously or be strongly associated with a provocation (e.g. exertion or coughing) [2]. In 2002, this definition of overactive bladder was revised by International Continence Society (ICS) as "urgency, with or without urgency incontinence, usually with frequency and nocturia". OAB may be idiopathic or may occur with other common conditions such as bladder outlet obstruction, neurological disease, or stress incontinence [3]. In this review, we are focusing on the longitudinal course of idiopathic OAB. To prevent the confusion about the definition of OAB and biased results, only articles with large scale epidemiologic studies using the definition of OAB by the ICS have been selected and discussed in this review.

## LONGITUDINAL EPIDEMIOLOGIC STUDIES OF IDIOPATHIC OVERACTIVE BLADDER

Most epidemiology studies are cross-sectional surveys and have focused on the prevalence, incidence, comorbidities and the impacts on quality of life [4-6]. There is a paucity of information on large-scale, long-term outcomes, remission rates and the natural history of idiopathic overactive bladder.

In a 3-year prospective cohort study conducted in the general population from Leicestershire and Rutland in the United Kingdom, a total of 20,247 women  $\geq 40$  years old were randomly sampled, and 65% of women responded to a postal questionnaire on urinary symptoms, co-morbidities, life style, general health and demographics. They found that the severity of OAB increased with age in the 40s, and plateaued in the 50s, followed by a steep rise in the 60s, a continued

rise in the 70s and a plateau in the 80s. The incidence and remission rate of OAB were 6.9% and 38.8%, respectively in Year 1 of the study, 6.0% and 38.9% in Year 2, and 6.8% and 36.9% in Year 3. In contrast to the severity of stress urinary incontinence (SUI) which showed two age-related peaks around the 60s and 80s, the authors concluded that the severity of OAB increased progressively with age including a period of accelerated increase in the 60s [7].

In the largest population-based survey conducted in 5 countries in Europe using the ICS 2002 definitions, a total of 19,165 subjects were enrolled and the prevalence of OAB was 12.8% in women and 10.8% in men. Women had a higher prevalence of OAB than men before the age of 60 years, but men had a higher prevalence after the age of 60 years. Unfortunately no longitudinal survey was done in this large-scaled study [8].

In another long-term, longitudinal, cohort study conducted in Australia, 132 women with an urodynamic diagnosis of idiopathic OAB were followed over a period of 5 to 10 years (median of 8 years). A total of 76 (67%) of the 132 women responded to a questionnaire after the 5-10 years follow-up. About 35% of the responding women categorized their OAB severity as "fluctuating but no worse", 25% reported as "no change" and more than 20% reported their OAB as "progressively worse or fluctuating and becoming worse". Less than 20% of the women categorized their OAB severity as "largely or completely resolved" [9].

Recently a longitudinal population-based study conducted in Gothenburg, Sweden, had showed a marked overall increase in the prevalence of urinary incontinence, OAB and other lower urinary tract symptoms in the same women from 1991 to 2007 [10]. Women over 20 years old were randomly selected from the Swedish National Population Register, assessed in 1991 ( $n=2911$ ), and the same women were reassessed in 2007 ( $n=1408$ ). Interestingly 17% of the selected women had OAB (dry and wet) in 1991 but the prevalence of OAB increased to 26% in 2007 after reassessment using a similar self administered postal questionnaire. Around 53% of women with OAB wet in 1991 still had OAB wet in 2007 but 26% of OAB wet had changed no OAB and 21% OAB wet became OAB dry. In the contrast 49% of women with OAB dry in 1991 had no OAB in 2007, 28% had progressed to OAB wet and 23% still had OAB dry (Table 1).

## IS OVERACTIVE BLADDER A PROGRESSIVE DISEASE?

In contrast to the reduced prevalence of OAB in children with age, it seems that the prevalence of OAB in adults increases with age from 11.8% to 26% [5,6,8,10,11]. In the recent Swedish study, the data showed a progression from OAB dry to OAB wet in 28%, remission from OAB dry to no OAB in 49%, and remission from OAB wet to no OAB in 26% of the studied population [10]. In the Australian study,

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Table 1. Summary of Three Longitudinal Studies

Authors (published year)	Follow-up duration	Sample size/response rate/method	OAB outcomes	Major study findings
Donaldson et al [7] (2006)	3 years	20,247 women 65% response rate Postal questionnaires	Remission rate Year 1: 38.8% Year 2: 38.9% Year 3: 36.9%	The severity of OAB increased progressively with age including an accelerated period in the 60s
Morris et al [9] (2008)	8 years	132 women with urodynamic diagnosed idiopathic detrusor overactivity (IDO)	35% of women achieved improvement	IDO seldom resolved but fluctuating in severity The presence of urge incontinence is associated with worse prognosis
Wennberg et al [10] (2009)	16 years	2,911 women 77% response rate Postal questionnaires	49% women with OAB dry became no OAB 26% women with OAB wet became no OAB	A marked overall increase in the prevalence of UI, OAB and nocturia in the same women from 1991 to 2007

OAB: overactive bladder; UI: urge incontinence

over 50% of OAB patients had a stationary condition and less than 20% of OAB patients had a progressive condition after 5-10 years followup [9]. A similar remission rate (25.6% to 30%) was also noted in a population-based study of lower urinary tract symptoms in Denmark [12]. Since these epidemiologic studies did not assess the relationship of underlying co-morbidities to OAB, it would be difficult to determine the exact cause for the progression of OAB. However, age, bladder outlet obstruction and underlying neurologic condition may contribute to its development.

## CONCLUSIONS

The prevalence of OAB in adults increases with age. Without consideration of associated factors, OAB is not a progressive disease. The natural course of OAB is dynamic and variable over time. Around 50% of OAB patients would have a fluctuating but no worse/stationary condition after long-term followup. The overall remission rate is around 20 to 35%.

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