The Epidemiology of Pelvic Floor Disorders and Childbirth: An Update

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KEYWORDS

• Pelvic floor disorders • Childbirth • Vaginal delivery • Cesarean section
• Urinary incontinence • Pelvic organ prolapse • Fecal incontinence

KEY POINTS

- Pelvic floor disorders are highly prevalent among adult women.
- Vaginal childbirth is strongly associated with the incidence of pelvic floor disorders later in life.
- Injury to the levator ani muscle as well as functional changes in the muscle may result from vaginal birth and may contribute to the development of incontinence and prolapse.
- Prevention and treatment of obesity may reduce the burden of symptomatic pelvic floor disorders.

The study of the epidemiology of any disease starts with case definition. Pelvic floor disorders (PFDs) include stress urinary incontinence (SUI), urgency urinary incontinence (UUI), overactive bladder (OAB), pelvic organ prolapse (POP), and fecal or anal incontinence (FI, AI). Numerous definitions and classification schemes have been proposed for these individual PFDs. Variations in definitions, both in clinical practice and in the literature, create variability in estimates of prevalence and incidence.[1] For instance, mild POP, defined as any degree of prolapse on examination, is practically universal in older women[2]; but women may not have symptoms unless prolapse is more severe.[3] Thus, estimates of the prevalence of POP will be impacted by the threshold used to define the condition.

Additionally, definitions proposed for clinical practice may not be sufficiently precise for epidemiologic research. In 2009, the International Continence Society (ICS) and the

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International Urogynecologic Association provided updates on defining PFDs.[4] Urinary incontinence (UI) is defined as involuntary loss of urine. However, the definition does not specify a measurement standard for this condition. Similar limitations are noted with the ICS definitions for other PFDs. OAB is defined as urinary urgency (usually accompanied by frequency and nocturia), with or without UUI, in the absence of urinary tract infection or other obvious pathology. POP is defined as the "descent of one or more of the anterior vaginal wall, posterior vaginal wall, the uterus (cervix) or the apex of the vagina (vaginal vault or cuff scar after hysterectomy)," correlated with symptoms, assisted by any relevant imaging. FI is defined as involuntary loss of feces, whereas AI is involuntary loss of feces or flatus.[4]

As noted by Sung and Hampton in 2009,[1] "the generalized lack of agreement on an epidemiologic definition of incontinence has limited the ability to obtain precise and consistent estimates of prevalence, incidence, and remission rates. In addition, differences in target populations, study and survey methodology, and questionnaire design increase the variability of estimates between studies." Prior publications have addressed various validated standards for the measurement and classification of PFDs.[1,5–7]

PREVALENCE AND PUBLIC HEALTH BURDEN OF PELVIC FLOOR DISORDERS

Despite the challenges of measuring and classifying PFDs in epidemiologic research, recent studies have provided valuable estimates of the prevalence of these conditions. PFDs are common. Based on a cross-sectional study of a nationally representative population of women in the United States, the prevalence of at least one PFD was 23.7%. The prevalence was more than doubled in women 80 years or older.[8] The probability that a woman will undergo surgical correction of POP by 80 years of age is estimated to be 1 in 5.[9,10]

Research also suggests that PFDs often coexist. For example, in a study of more than 5000 parous Swedish women,[11] 46% had at least one disorder and almost a third of these symptomatic women had 2 or more disorders. Similarly, in a Kaiser study, at least one PFD was reported by 34% of women older than 40 years and 16% of symptomatic women had more than one disorder; specifically, 9% of the symptomatic women had both UI and FI and 7% had both UI and POP (**Fig. 1**).[12]

Because of their high prevalence, PFDs have a large economic burden. In 2006, the estimated direct annual cost of ambulatory care for PFDs in the United States was $412 million.[13] As the population ages, health care utilization for PFDs is predicted to grow. Wu and colleagues[14] used US Census Bureau population projections to estimate the total number of women who will undergo surgery for POP from 2010 to 2050 and determined that this number is expected to increase by 48.2% over these 4 decades.

The limitation of studies on health care utilization is that some women with PFDs do not seek care. In a population-based sample of women 40 years or older, the prevalence of UI was 41%; but only 25% of symptomatic women sought care, 23% received some care, and 12% received subspecialty care.[15] In a community-based Internet survey of women older than 45 years, 19% reported accidental bowel leakage but only 29% of those had sought care.[16] Thus, the incidence of care seeking provides an underestimate of the public health burden of PFDs among US women.

PELVIC FLOOR DISORDERS AS CHRONIC DISEASE

One model for conceptualizing the development of PFDs in women was published in 1998 by Bump and Norton[17] (**Fig. 2**). This model provides a framework for discussion

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