**Depression and incontinence**

**Abstract** The urologic literature suggests that there is an association between a variety of psychiatric disorders and incontinence. Most notably, depression is found in a significant percentage of patients with urinary incontinence. Depression also occurs in other conditions associated with urinary urge incontinence, such as aging and dementia, and in neurologic disorders such as normal pressure hydrocephalus. Correction of some neurologic disorders eliminates both depression and urge incontinence. Although chronic medical disorders such as urge incontinence may lead to depression, an alternative hypothesis is that these two conditions share a common neurochemical pathogenesis. Lowering monoamines such as serotonin and noradrenaline in the central nervous system (CNS) leads to depression and urinary frequency and a hyperactive bladder in experimental animals. Thus, depression may not only be the result of persistent urinary incontinence, but individuals with altered CNS monoamines could manifest both depression and an overactive bladder. The latter condition may lead to urge incontinence, urinary frequency, urgency, or enuresis. Uncovering further evidence for such a linkage could serve as the basis for the development of genetic markers and novel therapeutic interventions for these two conditions.

**Key words** Serotonin · Bladder · Micturition

It is common for patients with urinary incontinence to exhibit a variety of psychiatric disorders [14, 20, 21, 43]. These disorders range from somatization and anxiety to depression. Some psychiatrists have even suggested that urinary incontinence is a manifestation of a psychosomatic disorder [4, 14, 38]. This misinterpretation was supplanted by contemporary anatomical and physiological concepts. The underlying mechanisms of incontinence have been elucidated by urodynamics and magnetic resonance imaging (MRI) of the pelvic floor. Nevertheless, quality of life analyses of individuals with urinary incontinence repeatedly uncover a variety of emotional disturbances in incontinent patients, especially depression. This is exemplified by a small case control study of 63 women, in whom 86% with detrusor instability scored high in hypochondriasis, depression, and hysteria scales on the Minnesota Multiphasic Personality Inventory (MMPI) [47].

It would seem obvious that the unexpected, involuntary loss of urine produces emotional distress, embarrassment, and feelings of loss of control, which can lead to depression. A more provocative explanation is that the biochemical imbalances that may lead to depression could also make the same patients more prone to involuntary bladder contractions which can cause either urge incontinence or enuresis. This report briefly reviews the association between incontinence and depression.

**Prevalence of depression in incontinent patients**

Depression is among the most common psychiatric disorders with a prevalence varying by sex and age. Table 1 lists the symptoms associated with depression. To diagnose depression a patient should exhibit at least five of these symptoms for more than 2 weeks in the absence of confounding associated conditions such as certain medical disorders, drugs, or bereavement [30]. The
Table 1 DSM-IV criteria for major depressive episode

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

1. depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful)
2. markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
3. significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day
4. insomnia or hypersomnia nearly every day
5. psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
6. fatigue or loss of energy nearly every day
7. feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
8. diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
9. recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

B. The symptoms do not meet criteria for a mixed episode.
C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).
E. The symptoms are not better accounted for by bereavement.

Table from DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, 4th edn 4. Copyright American Psychiatric Association, Washington, 1994

Prevalence of depression ranges from 2.2% to 26.8% in the general population. Survey instruments, patient self-reports, and structured interviews are employed to reach a diagnosis of depression (see Table 2). Depression is more common in women than men regardless of age. Depression also increases in prevalence in the elderly and affects at least 5 to 8% of those over age 65 living in communities [9, 42]. In contrast to younger individuals, depression in the elderly is more often related to acute health problems and lack of social support. It is uncommon in the physically healthy aged individual.

However, prevalence rates are sensitive to diagnostic methodology and the population studied. In addition, the influence of confounding factors such as co-existent medical conditions and medications is difficult to assess even in a multivariate analysis. Prevalence rates based on prospective community-based populations with structured interviews rather than cross-sectional self-reports provide more robust evidence for linkages and cause/effect relationships. Temporal relationships between incontinence and depression can only be supported when community-based prospective studies are employed. Unfortunately, such studies are rare. Mere association rather than causality is suggested by studies employing cross-sectional data based on self-reports.

Despite these limitations, there are many reports linking depression and incontinence. Depressive symptoms are more likely to be reported by older adults and especially women (Table 3). In a prospective randomized controlled study of 668 community-dwelling elderly (> age 60), Dugan and coworkers [11] found that 43% of those with incontinence were depressed compared to only 30% of continent subjects. Depressed patients were more likely to be female and in poor physical health. This study failed to discriminate between stress, urge, or mixed urinary incontinence. However, there was a positive correlation with the degree of urine loss and depression, suggesting causality.

Thom and co-workers [40] followed nearly 3000 health maintenance organization (HMO) patients with ages ≥65 years for 9 years. They found that 35% of elderly members were occasionally incontinent and daily urine loss occurred in 3 to 7% of individuals. Men exhibited half the incontinence rates of women. There was an increased risk of newly recognized incontinence following the diagnosis of depression. The relative risk was 1.6 (1.2–6.0) in women and 2.0 (1.6–2.7) in men. In another population-based cohort study, urinary incontinence was predictive for high levels of depressive symptoms [3]. Depression was diagnosed by a CES-D score of 16 or greater in 42% of incontinent versus 23.8% of continent subjects.

Differences in prevalence rates can be related to the diagnostic expertise of the health care providers and to the diligence with which they search for these conditions. Silverman and co-workers [34] studied community-dwelling adults and compared diagnostic rates for depression and incontinence between primary care professionals and health care providers trained in a geriatric assessment unit. When compared to a coordinated effort in geriatric centers, primary care providers diagnosed depression and incontinence less frequently (17 and 9% respectively). The geriatric assessment unit found that a third suffered from significant depression. Thirty percent also had incontinence. This report suggests substantial under-reporting of these conditions, especially in the elderly.

In contrast a study of patients residing in nursing homes by Brandeis [5] found no association between depression and incontinence. 10.3% of patients with incontinence exhibited depression compared to 13% of continent controls (p = 0.14). However, these rates for incontinence and depression are lower than in other studies of nursing home inhabitants. One confounding factor explaining this disparity may be medications. Resnick and co-workers [29] reported that antidepressants may protect against incontinence.

The ability to prove bidirectional causality between depression and urinary incontinence remains problematic. In one series, investigators sought to determine if