more inclined to visit physicians than men, even with the same symptoms.

If women go to the physician more often than men, for whatever reason, this may have a beneficial effect. Diseases such as hypertension or diabetes may be identified and treated earlier, and therefore mortality for women may be postponed. Alternatively, visits to the physician may lead to more inappropriate drug use in women than in men.

Finally, figure 5 presents data on nursing home residents per 1,000 population in the United States. At all ages over 65, women are at greater risk of being institutionalized, possibly because more elderly women than men live alone. Among men and women over 65, 40 percent of women live alone, while only 15 percent of men live alone. So there may be fewer available caretakers for the elderly woman. Women's higher use of institutional care may therefore reflect their living situation as well as differences in health.

In conclusion, compared to men, women have lower death rates at all ages, a longer life expectancy (even after age 65), but report more illness. However, diseases among elderly women appear to be less life-threatening than those among men, and women may be more inclined to report illness than men. Women use more health services than men and, among the elderly, they are more often caregivers than men. Questions remain as to why these sex differences occur, and whether women's greater life expectancy is associated with a greater *active* life expectancy or if women are experiencing more years of disability and dependency.

Older Women's Health: Contemporary and Emerging Health Issues

Urinary Incontinence

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Synopsis

Incontinence has about a 15 percent prevalence among elderly women. Some of the factors associated with incontinence are psychosocial implications of stigmatization, the decreased quality of life, and the economic considerations of nursing home costs. There are numerous, often misdiagnosed, reversible causes of incontinence, and many of the problems associated with aging may be alleviated if incontinence is treated symptomatically and controlled.

URINARY INCONTINENCE in the elderly is clearly a major problem; it is prevalent, morbid, costly, and neglected (*1*).

The prevalence of incontinence in this group is impressive. Preliminary data from American studies suggest that the prevalence ranges between 15 percent and 30 percent. It is twice as prevalent in women as in men, and its prevalence increases with advancing age. Data from younger populations, and data from nursing homes (where the prevalence is roughly 50 percent) suggest that more persons suffer from incontinence than from diabetes.

The morbidity of incontinence is substantial, with costs measured in medical, psychosocial, and economic terms. Medically, incontinence is associated with pressure sores; infections of the leg, groin, and bladder; and falls that result in subsequent fractures of the hip, spine, and skull. Psychosocially, incontinence is associated with severe stigmatization, ruined sex lives, broken relationships, premature retirement, embarrassment, anxiety, isolation, depression, regression, and, ultimately, institutionalization.

Economically, the costs of incontinence are startling. In 1983, the Surgeon General estimated that the additional expense engendered by incontinence in the nursing home was $8 billion—a figure that exceeds the combined amount devoted to dialyze

every American with renal failure and to operate on all those who undergo coronary artery surgery. It is also twice what we spend to feed every child in America on the school lunch program. And, closer to home, it exceeds the entire budget of the National Institutes of Health by 50 percent. And that sum is just the amount devoted to diapering the 15 percent of incontinent elderly who are institutionalized. The amount expended by the 85 percent of incontinent elderly living in the community is completely unknown.

Yet, despite its considerable prevalence, morbidity, and expense, until recently, incontinence has been systematically neglected. Only one incontinent individual in five will consult a health care provider, and sadly, when they do, less than one in three of us will initiate even the most rudimentary evaluation—sadly because incontinence is no more a normal part of aging than is chest pain or diabetes. Furthermore, studies have shown that, with appropriate treatment, two-thirds of incontinent elderly can become dry or nearly so, and the remainder can be significantly palliated.

The discussion that follows reviews the anatomy and physiology of the lower urinary tract, focusing on the changes in its function that occur with age and then reflects on why these changes predispose the elderly individual to becoming incontinent. It examines the various types of incontinence encountered in elderly individuals and outlines the options available to treat them. Along the way, this discussion may dispel some of the myths that have enshrouded this condition for too long and may allow consideration of the implications of these data for policymakers.

Anatomy and Physiology

The anatomy and physiology of the lower urinary tract is easiest to understand if viewed in three sections: the bladder and its outlet, the local innervation, and the associated pathways from the brain and spinal cord.

The bladder itself is composed of three layers of interdigitating smooth muscle, collectively known as the detrusor. The outlet comprises two sphincters: an internal one at the bladder neck and an external one located more distally.

The innervation of the lower urinary tract is derived from both the involuntary and voluntary nervous systems. The involuntary nervous system, known as the autonomic nervous system, innervates the bladder via its parasympathetic division. Increased parasympathetic tone leads to an increased force and frequency of bladder contraction. The other branch of the autonomic nervous system, the sympathetic nervous system, innervates the internal sphincter; increased sympathetic tone leads to tighter closure of the sphincter. The voluntary (somatic) nervous system innervates the external urethral sphincter and permits the individual to interrupt voiding volitionally. The brain and brainstem both modulate and coordinate filling and emptying of the bladder. The brainstem insures that adequate sphincter relaxation accompanies bladder contraction, while the basal ganglia and frontal lobe centers permit unconscious as well as volitional inhibition of bladder contraction, thus allowing the bladder to continue filling until a socially appropriate time.

Physiologic Changes with Aging

Although I have stated that incontinence is not a normal part of aging, I have also pointed out that its prevalence increases with age. To reconcile these seemingly contradictory statements, we need to review several of the changes that occur with normal aging. First, there is an increased likelihood that an individual will have involuntary bladder contractions. Second, the pattern of fluid excretion is altered, so that older people excrete most of their daily fluid intake after 8 or 9 p.m. The latter fact explains why most older people awaken at least once nightly in order to void. Third, the bladder shrinks. Finally, the strength of the urethral sphincter declines. None of these changes is alone sufficient to cause incontinence, but each reduces the reserve capacity of the lower urinary tract to withstand an additional insult. These insults usually take the form of a toxin, a medication, or an illness outside the lower urinary tract. Since elderly individuals are more likely than their younger counterparts to encounter one or more of these insults, it is now easier to understand why older individuals are more likely to become incontinent.

These principles have important corollaries as well. Since most precipitants are reversible once identified, incontinence is more likely to be reversible in older people than in younger people. Additionally, since reversal of the precipitant is often all that is needed to restore continence, it is not always necessary to correct an underlying urologic condition if one is present. These corollaries have important implications for frail, debilitated individuals who are not surgical candidates; they also increase the role of the primary care provider in evaluating and treating the older incontinent patient.

Examples of reversible precipitants abound. Delir-

ium or confusion can be induced by illness in any part of the body. Typical illnesses include venous blood clots, heart attacks, congestive heart failure, and occult infections. By inducing confusion, they secondarily lead to incontinence since the patient does not know or care that the bladder is full. Once the underlying cause of the confusion is identified and reversed, incontinence usually resolves. Symptomatic urinary tract infections are another cause of incontinence that is easily treated.

Atrophic urethritis is another cause of transient incontinence. Atrophy and inflammation of the urethra and vagina are frequently found in elderly incontinent women and seem to result from declining hormonal levels. Since the lower part of the urethra is influenced by the same hormones as the vagina, a decline in these hormones can lead to atrophy of the lower urethra, making the underlying tissues more susceptible to the irritating effects of acid urine. Once identified, the condition is easily treated with very low doses of intermittently administered estrogen.

Medications are another common cause of transient incontinence, since the drugs causing problems are used ubiquitously to care for the elderly woman. The relevant categories include sedative hypnotics, potent diuretics (including alcohol), anticholinergic agents, drugs affecting the autonomic nervous system, and calcium channel blockers (smooth muscle relaxants). Each of these major drug categories affects the lower urinary tract in divergent ways, but suffice it to say that each can induce incontinence which is readily reversed once the drug is discontinued. It is important to note that many of these medications can be purchased as over-the-counter preparations, including sleeping pills, antihistamines, cold capsules, and decongestants. Three-quarters of the elderly use over-the-counter medications, and when they do so, they take an average of two of them. Frequently, they do not consider these to be "real" drugs since they are not prescribed by a physician; unless directly asked, patients are unlikely to mention using them. Therefore, it is crucial for a physician to inquire about the use of all medications.

Psychological causes are probably an overemphasized cause of incontinence. Occasionally a patient is extremely depressed or behaviorally disturbed and either does not care to remain dry or uses incontinence to gain attention. Although this is not well studied, I believe this is a rare situation.

Endocrine causes of transient incontinence include poorly controlled diabetes or an elevation of the serum calcium.

Restricted mobility is another cause of transient incontinence. It may be associated with low back

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discomfort or a flare in an individual's arthritis; alternatively, a physician may prescribe bed rest for a patient with a fracture of the spine or hip, or a recent heart attack. Unfortunately, especially in hospitals and long-term facilities, restricted mobility is also due to being bound or "poseyed." In each of these situations, once the problem is identified and dealt with, incontinence will resolve.

Stool impaction is the final cause of transient incontinence, and has been impugned in up to 10 percent of incontinent individuals who attend tertiary care incontinence clinics. The mechanism by which it induces incontinence is unclear, but disimpaction restores continence.

If incontinence persists, then it is due to one or more of the "established" causes. The causes can be divided into four basic groups. First, the bladder may contract when it should not, escaping the individual's control. This is known as detrusor overactivity and is a common cause of incontinence in elderly women. Second, the bladder may not contract when or as well as it should, leading to progressive retention of urine until it eventually spills over. This is known as detrusor underactivity. Third, the outlet may be open when it should be closed, leading to a condition known as stress incontinence, another common cause of incontinence in this age group. Finally, the outlet may be closed when it should be open. This leads to retention of urine until spill-over occurs and results in overflow incontinence. These are the four basic categories of established incontinence, and as the great prophet Hillel once said, "All the rest is commentary."

For each of these abnormalities, a variety of interventions are available and effective, including environmental manipulation, behavioral approaches, exercises, various devices, medications, and surgery.

Surgery is low on the list for two reasons. First, as we have seen, elderly individuals are more likely than their younger counterparts to be incontinent due to reversible medical causes and are thus less likely to

require an operation. Second, if an operation is needed, recent advances in surgical technique have resulted in the development of numerous operations that are now available and feasible for even the oldest, most frail, and debilitated individual. These operations can be done in 15 to 45 minutes, frequently under local or regional anesthesia, and occasionally in an outpatient department. Even when the patient is hospitalized, she can be discharged in just a few days. Thus, for many of the conditions correctable by surgery, almost any elderly individual is now a potential candidate.

Finally, and fortunately for both professionals in the field and those who suffer from incontinence, two organizations have been established that are dedicated to supplying information and advice, as well as assistance in setting up self-help groups. These are the Simon and HIP Foundations.

Having considered available treatments, it is important to dispel some of the myths that still inappropriately surround incontinence:

1. Incontinence is not a normal part of aging, but rather a pathologic symptom of an underlying disorder.
2. Incontinent patients are not all senile or demented. In fact, only the minority are.
3. Demented individuals are actually continent until the end-stage of their disease, and even then many remain dry. Thus, it is no longer tenable to ascribe incontinence in nursing home residents merely to dementia and not to pursue the evaluation further. Surgically correctable causes of incontinence are found in roughly a quarter of these patients, a figure similar to the data for nondemented institutionalized residents.
4. Even if a surgically correctable cause is not found, whether the patient is demented or not, he or she can usually be cured or substantially improved.

Dispelling these myths has been an important result of the research done in just the past few years. But how many incontinent individuals continue to suffer from other potential myths that have yet to be debunked?

From this information, a twofold mandate emerges. First, we need much more information about this humiliating condition.

From a biomedical standpoint, we need more research into

1. lower urinary tract physiology and how it changes with age
2. the causes of incontinence
3. more accurate, less invasive diagnostic modalities
4. effective treatments

From a public health standpoint, we need to

1. examine the impact of incontinence on individuals' lives and pocketbooks
2. study its natural history and sequelae
3. identify and characterize those individuals most likely to become incontinent
4. design and implement appropriate interventions for them
5. evaluate the efficacy of these interventions.

The second mandate is to educate physicians, individuals, and society. We must teach them that incontinence is not a normal part of aging or something to be embarrassed about, but rather that it is a symptom of underlying abnormality that warrants systematic evaluation and treatment. In short, we need to get incontinence out of the closet so that we can do what we already know how to do.

The great 16th century philosopher, Francis Bacon, observed that, "The greatest obstacle to progress is the belief that no progress is possible." By identifying urinary incontinence as a problem, the work has begun and it should continue.

Reference

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