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Stress Urinary Incontinence: A Concise Historical Overview

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Abstract

Stress Urinary Incontinence (SUI) is a prevalent medical condition, particularly affecting women, and can have multiple underlying causes. It is ubiquitous in individuals who are overweight, experience increased abdominal pressure or have had multiple childbirths (multipara). SUI significantly impacts a person's quality of life, as it involves the involuntary leakage of urine during moments when physical forces on the bladder are heightened, such as during coughing, sneezing, laughing, or physical activity. Historically, the earliest theories regarding SUI linked the condition to the anatomical failure of urethral support. However, further research has revealed that it is not just anatomical failure but the dynamic interaction between the bladder and urethral pressures during increased intra-abdominal pressure that plays a crucial role in the onset of SUI. This understanding has broadened the focus of treatment, moving beyond just anatomical corrections to addressing the complex physiological processes involved. Interestingly, the issue of urinary incontinence is not new to medical history. The Ebers Papyrus, an ancient Egyptian medical text dating back to around 1550 BCE, contains approximately 900 treatments for various conditions. Among these are references to managing incontinence, specifically mentioning remedies to "remove the urine which runs too often" and to "remove constant running of the urine." This demonstrates that SUI, or conditions similar to it, has been recognized and treated for thousands of years, highlighting its enduring impact on human health. Here a short review of the history of SUI is reported which is essential to address more aspects of this complex situation.

Keywords: SUI, historical review, intra-abdominal pressure, quality of life, *physiological processes*

INTRODUCTION

The International Consultation on Incontinence defines stress urinary incontinence (SUI) as an involuntary loss of urine on physical exertion, sneezing or coughing, and a rise in abdominal pressure [1–3]. It is estimated that 50% of all incontinent women are affected by SUI, and this is the major type of incontinence in young and middle-aged women [3]. It is considered the most important health problem with substantial personal, family, and economic costs that have significant effects on health-related quality of life. It is the most common type of urinary incontinence in women, and in 1998, world population figures at least 78 million women over the age of 20 years had the symptom of pure SUI [4].

SUI can be treated through various medical interventions, including surgical procedures and pharmacotherapy. However, these options are not always appealing to all women, as they may involve significant risks and side effects, which

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can outweigh the potential benefits for some [5]. Common treatments for SUI include Pelvic Floor Muscle Training (PFMT), which helps strengthen the muscles that support the bladder and urethra, potentially reducing urine leakage. Drug therapies are also available, though their effectiveness and suitability can vary depending on the individual's condition. For more severe cases, surgery may be recommended to provide structural support to the pelvic organs, although surgical intervention carries its own set of risks [5]. Each treatment approach comes with its considerations, and women are often encouraged to weigh their options carefully in consultation with healthcare professionals to find the most suitable and least invasive solution for managing SUI. There has been growing interest in traditional remedies as they are regarded as quite safe with minimal or almost no side effects, cost-effective, readily available, and easily affordable [6]. In the classical texts of Unani medicine, the disease has been described under the heading of salisululbol. To treat this condition, renowned Unani physicians have advocated the use of drugs having qabiz (astringent), muhallil (anti-inflammatory), and muqawwie dimagh (brain tonic) properties. The qabiz action provides strength to the muscle, muhallil action causes the removal of morbid matter, and muqawwie dimagh action provides strength to the nerves [7, 8].

Historical Background

Egyptians were the first to describe urinary incontinence, which dates to the 2nd millennium BC, to name the contributors "*Papyrus Smith*" and the "*Papyrus Ebers*." In the 31st case of the Smith Papyrus, there is a reference to incontinence linked to spinal injury, demonstrating early recognition of the connection between neurological damage and urinary dysfunction. The Smith Papyrus, an ancient Egyptian medical text, provides one of the earliest known descriptions of how spinal injuries can result in issues, such as loss of bladder control. Similarly, the Ebers Papyrus, a comprehensive ancient medical document containing around 900 treatments for various ailments, also addresses incontinence. Among its remedies, there are specific references to managing urinary issues, with instructions to "remove the urine which runs too often" and to "remove constant running of the urine." These ancient texts illustrate that urinary incontinence, whether from neurological or other causes, has been a longstanding concern in medical history, with attempts at treatment dating back thousands of years [9].

In Ebers papyrus, prescriptions 273, 274, and 275 describe treatment for stopping the urine when it is very frequent. Possibly, this is the earliest description of incontinence in the history of medicine. In Edwin Smith's papyrus, a case is described in which subluxation of a cervical vertebra caused paralysis of the upper and lower limbs, incontinence, and priapism [10]. In Hearst Papyrus (1350 BC), the author described the treatment of burning micturition and incontinence of urine [11]. Ancient Egyptian sources had already described devices for urine collection in males and pessaries for females to manage urinary incontinence. These early innovations highlight the ingenuity of ancient medical practices aimed at addressing the practical challenges posed by such conditions. Greek medicine, led by the remarkable contributions of Hippocrates (460–377 B.C.), further advanced the understanding of urinary disorders. Hippocrates, often referred to as the "Father of Medicine," wrote extensively about the diseases of the urinary tract. His works included detailed discussions on procedures like perineal lithotomy, a surgical technique for removing bladder stones. In addition to this, he also explored the management of urinary incontinence, emphasizing the importance of understanding its underlying causes and potential treatments. The contributions from these early civilizations laid the foundation for the evolving knowledge and treatment of urinary incontinence throughout history [8].

Praxogoras elegantly described a patient with a recto-cystic fissure who was passing urine from his rectum and survived with this condition for at least 12 years [12]. *Rhazi* (865–925 AD) wrote about the wide variety of urinary tract disorders, the use of diagnostic urinalysis, nocturnal enuresis, and neuropathic bladder due to vertebral fracture [13]. He has described the treatment of *salisululbol* (involuntary loss of urine) in his famous book named *Kitabul Al-Hawi* [7]. He has also stated in his book *Kitabul Mansoori* about a condition known as *salisululbol* in which passage of urine occurs

without burning micturition and *bol fil farash* (passage of urine during sleep). He further recommended the use of *masikul bol advia* to treat the same [14].

The book named *Kamilussana,* authored by *Majoosi* (930–994 AD), mentioned the treatment of *salisululbol* by *baloot, kundur,* and *habe muhalib* [15].

Ibn Sina (980–1037 AD), the author of the famous medical encyclopedia known as Canon of Medicine, wrote about the importance of urine examination, and he was considered a forerunner of the science of uroscopy [13]. He has mentioned in his book *Al-qanoon* (Canon of Medicine) regarding *salisululbol*, a condition in which involuntary loss of urine occurs which is mainly caused by the excessive cold temperament of the bladder, laxity of the musculature, and excessive use of diuretics [16].

Ibn Hubl Baghdadi (1117–1213) has described renal and urological disorders. He has provided a description of the anatomy of the ureterovesical junction as well as the antireflux and urination mechanism. He has described urethral catheterization [13].

Abu Marwan Abdul Malik Ibn Zohar stated in his book *Kitabul Tahseer* that due to the weakening of the urethra and bladder, there is involuntary passage of urine called as *salisululbol*, and during this period, urine is passes drop by drop, and even treatment is mentioned [17].

Hakeem Gulam Gilani, in his book *Maghzinul ilaj,* has mentioned the treatment of *salisululbol* by describing many different types of formulations in the form of tablets, pills, powder, and *majun* [18].

One of the early modern breakthroughs in pharmacotherapy for urinary incontinence can be attributed to the works of Samuel Hahnemann (1755–1843), the founder of homeopathy. In his books, *Reine Arzneimittellehre* (1833) and *Die chronischen Krankheiten, ihre eigentümliche Natur und homöopathische Heilung* (1835), Hahnemann made significant strides by correctly distinguishing between the various types of urinary incontinence. He provided detailed descriptions and proposed specific medical therapies tailored to each type. His approach was groundbreaking at the time, offering a more nuanced understanding of incontinence and its treatment, setting a foundation for more personalized care in the field of urinary disorders [19].

Hakeem Akbar Arzani (17th and 18th century) has mentioned in his book *Tibbe Akbar* that *salisululbol* is the involuntary leakage of urine, which is of many types based on the causes, signs, and symptoms, and needs specific treatment [20]. *Azam Khan* (1813–1902 AD) has also described in his book *Akseer azam* as *salisululbol* is a disease in which urine leakage is involuntary, and it is caused by urethral *barudat* excessive *ratubat*, weakness of urethra and bladder [21].

In 1881, Frank performed a pioneering surgical procedure on a 37-year-old woman to address urinary incontinence. He operated transvaginally, excising a wedge-shaped portion from the posterior urethral wall, extending from the external urethral orifice to a point 1 cm below the bladder neck. This procedure involved the removal of both the vaginal and urethral mucosa. Additionally, Frank resected part of the vaginal wall at the level of the bladder neck.

This early surgical intervention was one of the first documented attempts to correct structural issues contributing to urinary incontinence, marking a significant step in the development of surgical treatments for this condition.

The defect was then closed with transverse sutures so that the passage of a 9-french catheter was just possible. The patient was continent at the time of control four months later [18]. Victor Bonney, in 1923, stated, "*Incontinence depends in some way upon a sudden and*

abnormal displacement of the urethra and urethrovesical junction immediately behind the symphysis" [21].

In 1930, the introduction of the Foley catheter marked a significant advancement in the management of urinary retention and incontinence. The indwelling Foley catheter revolutionized care by providing a reliable method for continuous bladder drainage, offering relief to patients who struggled with chronic urinary retention or incontinence [22].

In 1948, another milestone was reached when Dr. Arnold Kegel reported an 84% cure rate in women with various types of incontinence through PFMT. Kegel exercises, designed to strengthen the pelvic floor muscles, became a widely recommended noninvasive treatment for urinary incontinence, dramatically improving outcomes for many women. These innovations greatly expanded the options for managing incontinence, highlighting both surgical and nonsurgical approaches [23].

In 1996, Ulmsten et al. proposed the tension-free vaginal tape procedure for the treatment of SUI in women [24].

CONCLUSIONS

SUI is a complex disorder; exact pathophysiology and management are still awaited. A brief history of SUI is mentioned here, but apart from this, many more reviews on the historical background of this disease in all fields are needed to understand the disease thoroughly. On the other hand, continued research in the field of urinary incontinence is essential to further enhance women's quality of life. Advancements in both surgical techniques and non-invasive treatments, such as improved pharmacotherapy, biofeedback methods, and refined pelvic floor training programs, hold the potential to provide more effective and personalized care. Additionally, investigating the long-term effects of current therapies and developing new interventions will help address the diverse needs of women suffering from incontinence, ultimately contributing to better overall well-being and quality of life. Many menopausal women are suffering from SUI just because of a decreased level of serum estrogen, which is necessary to provide strength and support to pelvic organs. We need to work on that to provide maximum strength for the prevention of SUI and these conditions.

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