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Research Article

The development of urotherapy in pediatric care and the training of urotherapists

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Summary

The terms urotherapy and urotherapist are often mentioned in the literature, but their origins and meanings are less well-known.

Objective: To describe the background and development of the concept of urotherapy in pediatric care and the profession of urotherapist.

Methods: Data has been searched for in Medline PubMed and selection has been limited to papers important for the purpose.

Results: Understanding of urinary bladder function was developed in the 1970's, mainly due to new urodynamic methods opened up for possible treatment options. Standard urotherapy is a concept developed in the 1980's and aims to treat dysfunction by helping the patient to learn to understand bladder function and then practice certain techniques in order to normalize it. To succeed, guidance and support are needed from a skilled urotherapist. In Scandinavian and German-speaking countries, quality-assured training for urotherapists at the university level is available.

Conclusion: Urotherapy standard therapy is a non-invasive treatment recommended as the first-choice treatment for lower urinary tract disorders. However, we must have requirements as to what knowledge a urotherapist needs to have, and training has to be certified and be at the university level.

More Information

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Introduction

Urotherapy, well known in the field of urology, was developed by medical professionals from the areas of urology and pediatric nursing and has been an accepted concept in Gothenburg since 1979, at the Department of Paediatric Surgery, Queen Silvia Children´s hospital [1]. The intention was to develop a program for the treatment of bladder dysfunctions and give practical support to the child and families. Functional bladder diagnosis, the patient's experience of the problem, the patient's own resources, and their cooperation in their treatment formed cornerstones in the training program to normalize the function of the urinary bladder [1]. We named this new care concept, urotherapy.

The aim of this paper is to describe the background and development of the concept of urotherapy in pediatric care and the profession of urotherapist.

Methods

In this narrative review of the background, data has been searched for in Medline PubMed and selection has been limited to papers important for the objective.

Results of the background review

Knowledge of, and the significance of, urinary bladder function was rare before 1970 and most efforts were concentrated on renal function. In textbooks, you could read that the bladder was a harmless muscle sack containing urine and that in children, it automatically emptied when filled to a certain level.

Children with vesicoureteral reflux (VUR), hydronephrosis, or impaired renal function were cared for in pediatric surgery wards. In addition to check-ups, they frequently visited the hospital for treatment for recurrences

of urinary tract infections (UTIs). Some problems had a neurogenic or organic cause, but most of them had, with great probability, a functional disturbance, a condition described by Hinman 1973 [2], Allen 1977 [3] and Koff 1979 [4]. The treatment available at this time was often antibiotics to cure the UTI caused by the functional disturbance, which often ended up in resistance to bacteria.

During this period the knowledge of bladder function increased rapidly within different disciplines. Urodynamic methods developed and the availability of urodynamic methods for clinical use were invaluable tools in understanding bladder function and how normal bladder and bowel patterns could be studied [5,6]. The relaxation of the pelvic floor muscles in different positions was tested by Wennergren 1989 [7] and important anatomical studies formed a good basis for treatment [8]. The experiences of the patients were valued and subjective data was made measurable by using Quality of Life methods [9,10].

Fecal incontinence and constipation management, studied first in adults, was soon introduced in pediatric care [11,12]. Nowadays, bowel problems are included when taking voiding history and are treated as the first step to seeing whether the bladder problems emanate from constipation.

Urotherapy

A new approach to treatment was tested to let children learn and practice how to normalize their bladder function. The method of van Gool and Vijverberg, et al. was based on cognition and showed that dysfunction of the bladder could be treated by rehabilitation [13]. Furthermore, flow-biofeedback was regarded as an easy, non-invasive method to treat dysfunctional voiding [14]. However, there was a lack of information about residual urine which made the results uncertain. The program developed in Gothenburg consisted of instruction, timed voiding, cognitive training, relaxed micturition, support, and biofeedback in relation to the child´s functional diagnosis and ability to cooperate. This was all carried out in dialogues between the child and the urotherapist [1,15,16].

The Gothenburg program had its origin in urodynamic investigations. During the investigation, there was plenty of time for conversation with the patient. By visualizing what happened, while filling the urinary bladder with saline and simultaneously telling patients what could be expected of normal bladder function, we could see that this information acted as a guide for the children and influenced their own bladder function. At the second filling, the child had often improved the filling pattern and sometimes normalized it. Biofeedback became established as a treatment. During these biofeedback sessions, the child was asked to be aware of the feeling in the body during filling. The first step was trying to recognize when the pressure increased, looking at the screen and capturing signs in the body that indicated an upcoming contraction. The second step was deciding how to act. If the bladder had not reached its capacity, the child tried to inhibit the contraction when it began. The lesson learned from these urodynamic sessions was that the child needed to listen to the signals from the bladder, and also give the bladder directions on how to act so the child would gain control over the function. The same method could be used in the flow measurement procedure and by measuring residual urine it was possible to assess how well the emptying had succeeded.

Eventually, this behavior became more and more obvious and we were able to diagnose urinary problems by looking at the patient's history, micturition chart, flow measurement, and ultrasound of residual urine. We could then use this information for the rehabilitation of bladder function. Cystometry biofeedback was no longer necessary except in rare cases, and instead, the method known as standard therapy by the ICCS [17], was used see Table 1.

The development of urotherapy from Utrecht and Gothenburg has contributed to identifying important components of urotherapy named cognitive-behavioral-psychotherapy (CBT) by ICCS, the method constitutes the basis of all urotherapy [17] Table 1.

Specific urotherapy treatments

Specific methods [17], have been important for the development of the concept of urotherapy in that sense, it was aimed to normalize the urinary bladder pattern, and could also be performed outside the hospital. Clean intermittent catheterization (CIC), is a method described by Lapides and used with good results mainly in children with neurogenic bladder dysfunction [18]. Also, preschool children could perform CIC with assistance [19]. Another option for treatment was electro-nerve stimulation. This was used first in adults but soon after in children (Madesbacher -1982) [20]. Bladder stimulation may be used using different frequencies depending on the desired effect. Twenty Hz is used to improve bladder emptying, whereas 5 Hz - 10 Hz is for inhibiting bladder contractions in patients with urge incontinence [21,22] The electrodes could be placed on a

Table 1: Urotherapy: standard therapy, Gothenburg model.

Before treatment:
1. Dialogue about the results of the investigation; mapping the bladder pattern and the expected normal function. The child´s own experience of the problems, what is the worst problem? How is daily life for the child, own resources as responsibility and possibility for the child to use the toilet when needed?
2. Strategies discussion: Decision taken by the child and urotherapist on what will be done.
3. Standard therapy: Learn and practice at the clinic: a. Relaxed emptying; emptying technique is learned by practicing the differences between relaxation and tensing. b. Bladder regime; starting voluntarily in short intervals, between one and two hours, avoiding urge; increasing interval to two to three hours, when no urge at the first interval. Important to learn to micturate voluntarily without the urge.
4. A return visit to the clinic; for support, check of residual urine, and discussion of appropriate intervals between micturitions.

catheter in the urethra when treating bladder emptying difficulties, or in the vagina, rectum or perineum for relaxation of an overactive bladder.

TENS, transcutaneous nerve stimulation, was followed because it was an easier and more acceptable method to use. This method had shown good results together with standard therapy, or on its own [23].

Pelvic floor muscle training was established first as a treatment for stress incontinence [24,25], then this method was used in children with various types of bladder dysfunction to clarify the difference between relaxation *vs.* tensing [26]. Another specific method is alarm treatment, the first line treatment for bedwetting according to the ICCS standardization committee´ [17].

Effect of urotherapy

The effect of urotherapy as a concept in pediatric care is regarded as satisfactory [27,28]. The Cochrane review 2019, assessed the effects of conservative interventions on functional daytime urinary incontinence in children between the ages of 5 and 18 in 27 randomized control trials (RCT) including a total of 1803 children [27]. The review integrated both standard urotherapy, specific treatments, and comparisons between the two. However, the studies showed low certainty or very low certainty of the evidence, meaning that very little could be concluded with certainty due to poor study design. Another publication reviewed studies between 2008-2018 and showed similar results, indicating a reduction in symptoms [28]. Conclusions from the reviewers for the future were that more controlled studies and better-defined interventions and outcomes are needed. More information is needed with regard to the frequency of symptoms, and the number and time of urotherapy consultations.

Urotherapy units in pediatric care

Urotherapy requires teamwork where the urotherapist collaborates with pediatric urologists and pediatricians. In some centers, psychologists and other staff with a special interest in children with urinary tract problems, are members of the team. The urotherapy unit provides diagnostics and treatment, but it is also a clinic where families can get easy access to assessment, advice, and support. A urotherapist needs to be well-trained to be able to work independently with urotherapy. Simply working with urotherapy does not give the requisite qualifications necessary to be called a urotherapist.

Urotherapy training

Urotherapy training started in 1987 at the University of Gothenburg due to increased interest in, and the need for, knowledge when taking care of patients suffering from dysfunction of the urinary bladder and bowel, regardless of the underlying cause. The training involved diagnostics and treatment in children, women, men, and the elderly [29]. Table 2.

The training consists of five courses over a period of eighteen months. The courses are given one by one, one week at a time at the university, with enough time for self-studies and examinations. Assignments are in small groups and there are study visits and ordinary work in the student's own hometown Table 3.

Table 2: Certified urotherapist.
Goal to be achieved when all the elements of the training are completed.
1. Confirm the status of the function of the urinary bladder and bowel, including, history, micturition and bowel chart, continence test, 4-hour micturition observation, flow measurement, ultrasound bladder/bowel, and urodynamic investigations.
2. Evaluate the impact on daily life, the patient´s own resources, and demands in daily life
3. Providing different behavioral and training programs (in order to normalize the function of the bladder and bowel) biofeedback, alarm treatment, relaxation of the pelvic floor, pelvic floor muscle exercise, CIC and catheter care, electrostimulation, TENS and acupuncture advice, test and prescription of continence aids and catheters, as well as advice on sexual dysfunction and aids.

Table 3: The content of courses.
7.5 credits - Embryology, anatomy, physiology, pathophysiology and urotherapy
7.5 credits - Diagnostic methods
10 credits - Conservative and surgical treatments
7.5 credits - Urinary tract infections, motivating conversation and online health care programs
7.5 credits - Medical/technical aids and devices including poster presentation.

There are three universities giving urotherapy courses on a similar level and with similar content; the University of Gothenburg, Sweden; University of Bergen, Norway; and Klinikum Links der Weser, University of Bremen, Germany. There are now almost 1000 trained urotherapists from Sweden, Norway, Finland, Iceland, Germany, Switzerland Austria, South Tyrol (n = 1), and Vietnam (n = 1). Their backgrounds are mostly as nurses, the rest being physiotherapists, physicians, or midwives.

There is cooperation between the centers, and all urotherapists who have completed the courses can be members of the UTF, the Urotherapy Association, and be certified by this organization. This collaboration ensures the quality and level of knowledge on the course and the content of the training course meets the demands of the Swedish National Agency for Higher Education. This includes requirements for prior knowledge of the students, content of the courses, teachers' competence, literature, and examinations. UTF's education council has reviewed the three courses and assessed them as equivalent. However, there is a lack of courses aimed at English-speaking students.

There is a lack of studies evaluating the training, both from the students` and the patients` perspectives.

Discussion

The first publications on the subject of urotherapy were

pioneer works, originating from enthusiasm for the subject and devotion to patients, but also sharing knowledge about urinary bladder function and possible treatments. They came mainly from two centres in Europe [13,15,16,30]. The urotherapy treatment consists of hard work and collaboration between the child and family and the urotherapist. The skills of the urotherapist are of importance, but also to some extent so are the attitude and motivation of the child and family. For urotherapy to be successful, it must be based on knowledge and commitment. Eventually, when the patient understands the process, can use certain techniques by him or herself, reflects on what has been achieved, and can finally manage in different situations, then the family can take over [31]. The different steps in gaining control or not, listening to signals from the bladder and bowel, and giving the bladder and bowel instructions on how to act, all have a connection to the potty-training process [32-35].

The urotherapy concept has been available for more than 40 years and many clinics are established around the world and are valuable resources in health care. We are convinced that urotherapy is a helpful resource in healthcare, but high-quality studies are rare.

Urotherapy is the first-line treatment and performing an RCT including a control group that is not undergoing any treatment is not possible. The publications available are therefore comparisons between standard therapy and specific urotherapy where the differences in results may be low [27,28].

Obtaining knowledge is important. It is available on courses, at conferences, and on study visits. The ICS, International Continence Society, founded in 1971, meant a lot to the pioneers of urinary bladder and bowel research. The ICCS, International Continence Children's Society, came later and was established by Jens-Christian Djurhuus and Kelm Hjälmås 1991. The ESPU, and ESPU-N, European Society of Paediatric Urology, 1989, has been another important meeting place for updating expertise in urotherapy.

Formal education and training, including examination, ensure that the students have achieved specific knowledge goals. Quality-ensured education, with no conflicts of interest with industry, is important. Nevertheless, the industry has its place as a partner in the development of urotherapy. The urotherapy courses in Gothenburg have been popular and more students are applying than can be admitted. As well as knowledge, the courses also give the participants the chance to meet future colleagues to cooperate. (Urotherapists also have a closed group on Facebook/Instagram.) Including different specialties and ages has been shown to enrich thoughts and ideas. However, no research has been done yet concerning the outcomes of training.

However, urotherapy is not yet established as an independent academic subject, which affects its development to some extent. More and more nurses and physiotherapists have had post-graduate training over the last decades, which has facilitated the development of an independent profession. In the future, we need standards that specify what a fully-qualified urotherapist needs to know. The training also needs to be certified and a natural place for such training is universities.

Conclusion

Understanding of urinary bladder function and urodynamic methods opened up for urotherapy which is the first line treatment for dysfunction, developed in the 1980´. More controlled studies are needed with regard to information about details i.e. frequency of symptoms, and number and time of urotherapy consultations. However, there is a lack of studies evaluating the training to become a urotherapist, both from the student's and the patient's perspectives.

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