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Case Study

ROLE OF *UTTARABASTI* IN NEUROGENIC URINARY INCONTINENCE

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ABSTRACT

Neurogenic bladder refers to dysfunction of the urinary bladder arising from internal or external trauma, disease, or injury of the central, autonomic or somatic nervous system in the control of micturition. Depending on the nerves involved and the nature of the damage, bladder becomes either overactive or underactive and this usually presents clinically as urinary incontinence or retention of urine. Urinary Incontinence (UI) is a hygienic problem and is one of the troublesome, important cause of morbidity and impairment of quality of life, in both men and women. It may lead to recurrent UTI and ascending infections which affect the functioning of kidney. Deranged function of *Vatadosha* especially *Apanavata* along with *Pranavata* and *Vyanavata* are the main culprits of neurogenic bladder. Vitiated *Doshas* cause *Mootravahasrotodushti* and *Atipravritti* of *mootra*. This case study discusses the effect of *Mootramarga uttarabasti* in reducing the signs and symptoms of neurogenic urinary incontinence and thereby improving the quality of life. A 66 year old male patient was admitted with weakness in left upper and lower limbs, slurred speech, and difficulty in controlling micturition since 5 months. He was a diagnosed case of stroke on the basis of a brain computed tomography scan. During the course of management, *Uttarabasti* was administered for 8 days with *Dhanwantarataila* and *Balamoolakashaya* alternatively. The intervention resulted in reducing the symptoms of neurogenic urinary incontinence as evidenced by the reduction in ICIQ-UI -SF score. It was observed that the overall impact of the disease was reduced and quality of life improved with the help of King's Health Questionnaire (KHQ).

INTRODUCTION

Neurological disorders are the leading cause of physical and cognitive disability across the globe, currently affecting approximately 15% of the worldwide population. In 2019, the largest contributor to the total neurological disorder in India was stroke (37.9%). Neurogenic bladder dysfunction may be caused by disorders or damage to the central, peripheral, or autonomic nervous systems. Several neurologic diseases may become more complicated by neurogenic bladder dysfunction. In the US, neurogenic bladder affects 40% to 90% of MS patients, 37% to 72% of Parkinson's patients, and 15% of stroke patients [1]. Neurogenic bladder is those causing a failure of storage or those causing a failure of emptying. Most commonly patients with neurological disease have problems with the former and have incontinence.

The effects of a neurogenic bladder can be severe if they are not regularly monitored and not managed properly. These effects can include renal failure, recurrent urinary tract infections, and urolithiasis, which all continue to have a significant impact on the quality of life of these people. Damage to the nervous system is irreversible and is difficult to get a complete cure. Selecting the right bladder management approach is essential for their comfort and quality of life. In contemporary medicine, treatment for neurogenic bladder problems may involve surgical treatments to the bladder or urethra, internal medicines, intermittent catheterization, indwelling urine catheters, timed voiding, manual expression, and/or other therapies. Risk factors associated with these treatments are ascending urinary infections, upper urinary tract damage and kidney failure.

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There is no one-to-one correlation available in Ayurvedic classics with neurogenic urinary incontinence, but there are many conditions and some causative factors linked to etiopathology for such type of disease conditions described in many chapters in different texts. *Vatadosha* is the prime factor responsible for movement, motor and sensory activities of the body. Nervous system activity is primarily governed by *Vatadosha,* especially *Pranavata* and *Vyanavata. Apanavata* is responsible for *Mootranishkramana karma.* The treatments available for *Mootrarogas* in Ayurveda include *Adonabhipichu, Avagahasweda, Avapeedakasnehapana,* etc. However, these treatments show less significant effects. *Basti* is the best treatment mentioned for alleviating vitiated *Vatadosha*. In *Mootramarga, Uttarabasti,* per urethral administration of medicine is recommended for urinary disorders. Direct administration of drugs to the target cell might be achieved by *Uttarabasti*. *Basti* (bladder) is the *Sthana* of *Vata dosha. Uttarabasti* does function like *Samana*, some *Acharya* consider it like *Anuvasana basti* as it does *Snehana* [2]. However, few authors consider it like *Niruhabasti* because it performs cleaning as well. *Bala* is a popular drug used in various formulations especially, *Vatarogas. Bala* is the main drug in *Dhanwantaratail*a, a popular yoga indicated for all *Vatarogas* and *Mootraghata* [3]. *Taila (Sneha)* is the ultimate treatment for *Vata vaigunya.*

Patient Information

A 66 year old male patient, who is a farmer with H/O Hypertension, was admitted with weakness in left upper and lower limbs, slurred speech, and difficulty in controlling micturition since 5 months. Patient was apparently normal before 5 months. One day evening, while trying to pluck fruits from a tree he experienced sudden onset of slurring of speech, had facial droop on his left hand side with weakness in the left side upper and lower limbs. He was immediately shifted to a nearby hospital. Blood pressure was found to be elevated and the patient was unconscious. He was managed in an Intensive Care Unit with blood pressure, and intracranial pressure (ICP) management. He developed urine incontinence and catheterised. He was diagnosed as stroke and provided needful emergency management.

His neurological examination improved and was discharged to home after 5 days. Since then he has been under internal medications and physiotherapy. Patient was catheterised (foley catheter) since he was discharged from the hospital. He had no H/O DM, trauma, recent fever or infections. No family H/O any neurological issues. He has no addiction, no H/O chemical contact or chronic drug intake. Since the urinary complaints persisted and no improvement was seen in the patient, they approached to our hospital and got admitted in *Kayachikitsa* ward.

Investigations

Blood investigations were found under normal limit.

Urine routine examination on 02/02/2023, revealed pus cells 2-4 HPF, epithelial cells 0-1 /HPF

CT brain (as on 30/08/2022) showed acute intraparenchymal haemorrhage in the right capsuloganglionic region and right corona radiate causing mass effect and midline shift. Chronic lacunar infarct in bilateral capsuloganglionic region. Small vessel ischaemic changes in the brain.

USG abdomen (as on 18/01/2023) showed, urinary bladder- bladder wall thickened, B/L ureters not dilated, no renal calculi, no evidence of any focal lesion in spleen and pancreas, normal prostate, normal liver.

Personal History

Diet- Non-veg
Bowel- Constipated
Appetite- Poor
Micturition- Continues flow
Terminal dribbling - Present
Hesitancy- Absent
Continuous incontinence
Frequency - 7/day, 6/night
Nocturnal enuresis- Present
Sleep- Less

General Examination

Pulse- 72/min
HR- 72/min
BP-140/90 MmHg
Temperature- Afebrile
Respiratory rate- 22/min
Cyanosis- Absent
Icterus- Absent
Oedema - Absent
Gait- Sits with support

Systemic Examination

On neurological examination

Higher Mental Function (HMF)

Handedness - Right handed
Level of consciousness - Fully conscious, alert
Oriented to place impaired
Appearance and behaviour - Good cooperative
Emotional state - Anxious
Hallucinations, illusion, delusion - Absent
Memory - Intact
Speech - Dysarthria

Cranial nerves

Trigeminal - Motor part affected
Facial nerve - Affected
Accessory nerve (left) - Affected
Hypoglossal nerve - Affected

Motor system examination

Table 1: Muscle bulk

Right upper limb	25cm	Left upper limb	23cm
Right lower limb	41cm	Left lower limb	41cm

Table 2: Muscle tone

Right upper limb	Normotonic	Left upper limb	Hypertonic
Right lower limb	Normotonic	Left lower limb	Hypertonic

Table 3: Muscle power

	Right	Left
Shoulder	G5	G0
Elbow	G5	G0
Wrist	G5	G1
Thigh	G5	G3
Knee	G5	G3
Plantar	G5	G1

Table 4: Muscle reflex

Reflex	Right	Left
Biceps	++	+++
Triceps	++	+++
Supinator	++	+++
Knee	++	++++
Ankle	++	++
Plantar	Extensor response	Extensor response

Sensory System - Reduced sensation in both lower limbs

Gastrointestinal System- Normal

Genitourinary system - Urine incontinence (catheterized)

On examination, his *Prakriti* was *Vatapitta*, *Vaya –Vridha, Satva- Avara, Satmya- Sarva rasa, Anala- Manda. Bala - Rogibala- Avara, Bhoomi-jangala.*

Diagnosis

Left hemiplegia with neurogenic bladder

Treatment Schedule

Table 5: Treatment schedule

Date	Internal Medicines	External Treatment	Remarks
03/02/2023	*Gandharvahasthadi kashayam*- 90ml twice daily before food *Brihatyadi kashayam panam- Muhur muhur* *Balarishtam*- 20ml twice daily after food.	*Udwarthanam* with *Kolakulathadi choornam*- 7days	Feel lightness of the body, relief in constipation, appetite improved
10/02/2023	*Danadanayanadi kashayam*- 90ml twice daily before food *Balarishtam*- 20ml twice daily after food *Dhanwantaram gulika* 1-1-1 after food *Chandraprabha vati*- 2-2-2, after food *Ashwagandha choornam* 5gm with milk at bed time	*Abhyangam* with *Dhanwantarataila* for 7 days	Sleep improved, urinary incontinence persist
17/02/2023	*Maharasnadi kashayam*- 90ml twice daily before food with 10 drops *Dhanwantara*	*Patrapotaliswedam* with	Flexion on left knee noted. Strength of

	sevya taila *Saraswatarishtam*- 20ml twice daily after food *Dhanwantaram gulika* 1-1-1 after food	*Chinchadi taila* for 7 days *Pratisarana* with *Kalyanavaleha choornam* with honey and *Jambeera swaras* on tongue for 7 days	left leg improved. Urinary incontinence persist
24/02/2023	*Maharasnadi kashayam*- 90ml daily at 7:00pm with 10 drops *Dhanwantara sevya taila* *Saraswatarishtam*- 20ml in the evening after food *Yogaraja guggulu gulika* -2 after food	*Yogabasti*- *Anuvasanabasti* with *Sathahwadi Anuvasanataila* *Kashayabasti* with *Erandamooladi kwatha*	Speech improved. Movements of left upper and lower limbs improved. Urinary incontinence persist

Catheter was removed and assessed the urine flow. Primary care was given to improve physical symptoms. Found improvement in his physical symptoms, but still bladder issues persist. Then we planned *Uttarabasti*. First two days *Uttarabasti* was done with *Dhanwantaratail*a. On the third day to 8th day *Uttarabasti* with *Balamoolakashaya* and *Dhanwantara taila* was done alternatively.

Table 6: *Basti* schedule

Date	**03/03/23**	**04/03/23**	**05/03/23**	**06/03/23**	**07/03/23**	**08/03/23**	**09/03/23**	**10/03/23**
Basti	*Taila*	*Taila*	*Kashaya*	*Taila*	*Kashaya*	*Taila*	*Kashaya*	*Taila*
Dose	24ml	24ml	96ml	24ml	96ml	24ml	96ml	24ml

Assessment of signs and symptoms was done before and after treatment using ICIQ –UI SF (International Consultation on Incontinence Questionnaire - Urinary Incontinence Short Form) [4]. The quality of life was assessed before and after the treatment with the help of King's Health Questionnaire (KHQ) [5].

OBSERVATIONS AND RESULT

The ICIQ-UI is a questionnaire for evaluating the frequency, severity and impact on quality of life of urinary incontinence in men and women in research and clinical practice. The overall scores can be divided into:

Slight= 1-5 points

Moderate=6-12 points

Severe=13-18 points

Very severe= 19-21 points

Table 7: ICIQ-UI SF

Subjective parameter	**0th day (02/03/2023)**	**9th day (11/03/2023)**	**30thday (01/04/2023)**
Frequency	5	4	4
Amount of leakage	6	4	2
Overall impact of urinary incontinence	10	7	6
Total	21	15	12

The King's Health Questionnaire is a disease-specific, self administered questionnaire designed to assess the impact of urinary incontinence on quality of life. Extension of scoring is from 0 (best) to 100 (worst). Range of the symptom severity scale is 0 (best) to 30 (worst).

Table 8: King's Health Questionnaire – QOL

Domains	**0th day (02/03/2023)**	**9th day (11/03/2023)**	**30thday (01/04/2023)**
General health perception	100	75	50
Incontinence impact	100	66.6	66.6
Role limitation	0	0	0
Physical limitation	0	0	0
Social limitations	88.8	66.6	66.6

Personal relationships	66.6	33.3	33.3
Emotions	88.8	33.3	11.11
Sleep/energy	100	33.3	33.3
Severity measures	100	50	50
Symptoms severity scale	17	11	6

It was observed that the ICIQ-UI -SF score changed from 21 to 15 after the treatment. The score became 12 on the 30th day. The patient had very severe urinary incontinence before treatment and that was reduced to a moderate level after treatment. King's health questionnaire shows an improvement in quality of life after the intervention and on follow-up.

Urine routine examination as on 01/02/2023, pus cells 2-7/ HPF, epithelial cells 1-2/HPF.

Urine routine examination as on 02/03/2023, pus cells 2-4/HPF, Epithelial cells 0-1 /HPF.

DISCUSSION

Role of *Basti*, especially *Uttarabasti* in the managementof *Vatavyadhi* is concreted by the case experience. *Basti* (urinary bladder) is the *Sthana* of *vata dosha* and the process of micturition is specifically controlled by *Apana vata*. *Basti* is the *Agrya* in the management of *Vata vaigunya*. Direct administration of drugs to the target cell might be achieved by *Uttarabasti. Uttarabasti* acted on the neurogenic bladder by first-pass metabolism. The therapeutic effect of the trial drug was affected at the target site with very minimal systemic side effects and achieved by administering intravesical drug delivery (IVDD) through *Uttarabasti* [6]. It acts very fast due to direct application. *Uttarabasti* enters micro channels due to *Sukshmaguna* of *Taila* and it causes *Vatasamana* due to its *Snigdha guna. Uttarabasti* may stimulate organs which increase the blood supply favouring absorption of the drugs. *Sneha* in *Uttarabasti* is *Vatahara* and may have a supportive role and a nutritive function that may improve blood circulation, strength of the muscles and sphincters. *Taila* in *Uttarabasti* is beneficial as it quickly adheres to the urothelium after instillation. Best absorption of *Taila* can be achieved by *Mridurookshana* with *Kashaya* i.e., *Uttarabasti* with *Kashaya* may help to improve the activities of *Taila* inside the bladder. Also *Kashaya* expels the *Utkishtadosha* from the bladder and acts as a bladder wash. *Uttarabasti* with decoction has a cleansing action; by this cleaning action the process of micturition may be restored. *Dhanwanatara taila* acted on neurogenic bladder by its *Sookshmasrotogami guna, balya, Marmakshatahara,* and *Vatasamana* properties. Continious 8 days administration of the drugs alternatively into the bladder helps to overcome the Bladder permeability barrier (BPB) and achieve the desired effect. The stimulated neuro-receptors inside the bladder and sphincters improve the functionality of the system.

The main ingredients of *Dhanwataratai la* are *Tila taila, Ksheera* and *Balamoola.* The overall action of *Dhanwataratai la* is achieved by *Rasayana* and *Ojaskara* properties of *Ksheera*, *Tridoshahara, Balya, Sandhaniya, Vatahara* and *Kaphahara* properties of *Tilataila* along with *Tridoshahara*, *Balya* and *Grahi* properties of *Bala*.

Balamoola is *Mootratisarahara* and this plant contains mainly alkaloids, oils, steroids, resin acids, mucin and potassium nitrate. The root of *Sida cordifolia* is administered as a curative agent for nervous damage with its diuretic, tonic and antioxidant activities [7]. Both *Taila* and *Kashaya* provided strength (*Bala*) to detrusor muscles, external and internal sphincters of the bladder. It can also improve the nervous system activities and stimulate higher centres of micturition.

In general, *Bala* has described with properties like *Madura rasa* with *Kinchit tiktarasa, Guru, Snigdha guna. Seeta virya* and *Madhuravipaka*. The drug *Bala* is considered as *Balya*, *Dhatuvardhaka, Vrishya, Ojovardhaka, Grahi, Mootratisarahara* and *Vatahara*. *Madhura rasa* and *Madhuravipaka* alleviate *Vatadosha* and *Madhurarasa*, *Madhuravipaka, Seetavirya* help to alleviate the *Pittadosha*. *Madhura rasa* also helps to retain the strength of *Dhathus. Snigdhaguna* gives *Mardava* to the body and it increases *Bala* and *Varna* of the body. *Seetavirya* is having *Sthirikarana* property. By this property *Sthiraupachithamamsa* can be attained. So it can act on the smooth and skeletal muscles of the bladder and strengthen it. It can also regulate the contraction and relaxation of external and internal sphincters through these properties.

Sida cordifolia contains maximum amount of ephedrine alkaloid which can act as a stimulant on the cardiovascular and central nervous system[8]. Various physiological processes in both health and disease are under the control of the microbiome[9]. Urinary disease may appear as a result of disruptions in the microbial ecosystems. Patients with urge urine incontinence showed a strong correlation between increased symptom intensity and a reduced microbial diversity. A change in the microbiome situation inside the bladder will help the recovery with a refreshing bladder atmosphere. The balance of bladder homeostasis and urine microbiota can stay intact by administering medication through *Uttarabasti*.

CONCLUSION

The intervention resulted in reducing the symptoms of neurogenic urinary incontinence. It was observed that the overall impact of the disease reduced and quality of life improved. Follow-up was taken to evaluate the sustainability of the result. Catheter was removed and the patient attained a free flow of urine. No significant change in pus cells or epithelial cells was found after the study or after follow up. This case study showed that a challenging case of neurogenic bladder can be successfully treated by addressing the underlying pathology using Ayurvedic methods of treatment. During treatment, no adverse effects were observed.

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