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Effect of Naturopathic modalities in the management of recurrent Urinary Tract Infection

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ABSTRACT

Now a days recurrent UTI is on common infection among the people, more common in women, particularly in child bearing age. The current research aims at providing a cost effective, long standing treatment protocol for the management of recurrent UTI and also for minimizing the recurrence of symptoms for a longer duration.. The objective of the study is to assess the effect of naturopathic modalities in the signs, symptoms and microscopical features of recurrent urinary tract infection. The study was a before and after Quasi – experimental or Non- randomized design. Data from an individual case sheet Proforma specifying demographical data, general history, clinical history related to urinary tract infection, physical examinations, laboratory investigation, data related with treatment and its response were collected. A consultation and examination was performed to grade the signs and symptoms. Grading was done before and after treatment. Routine blood investigation including erythrocyte sedimentation rate (ESR) and data related to presence of pus cells in urine were also collected. The naturopathic modalities including hot hip bath, abdominal hot compress, juice therapy and diet control is found to be therapeutically very effective in reducing the symptoms of urinary tract infection. Juice therapy used in the study has diuretic and anti-inflammatory properties and provide good results.

Key words: Naturopathy, Urinary Tract Infection, Juice therapy.

INTRODUCTION

UTI is the most common bacterial infection and accounts for 1-3% of consultations. Up to 50% of women have a UTI at some time. The prevalence of UTI in women is about 3% at the age of 20, increasing by about 1% in each subsequent decade. Due to the drawbacks of antibiotics in UTI, here comes the

relevance of naturopathic modalities in the management of recurrent UTI.^[1]

Naturopathy supports regularization of metabolic process and excretion of waste material in body therefore helps in maintaining static constant condition of homeostasis. Instead of drugs, physical and chemical properties of water, mud and air are utilized as treatment modality. Naturopaths hold that the healing power of nature is behind all cures, whether with the aid of natural therapies or in spite of medical ones.^[2]

The current research aims at providing a cost effective, long standing treatment protocol for the management and also for minimizing the recurrence of symptoms for a longer duration.

The purpose of this study is to assess the effect of naturopathic modalities in the signs, symptoms and microscopical features of recurrent urinary tract infection. The collected data has conveniently categorized under three headings

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1. Demographic data
2. Data related to the disease
3. Data related to the response to treatment

METHODOLOGY

The clinical study in this work is an attempt to evaluate the effect of naturopathic modalities in the management of recurrent urinary tract infection. The study was designed as a clinical trial. The study group was managed by naturopathic modalities. A before and after comparative study was conducted.

Study Population

Patients with signs and symptoms of recurrent urinary tract in the age group 15 to 50 year, registered in the OPD of Dept. of Swasthavritha, Govt. Ayurveda College, Thiruvananthapuram registered during October – April 2012.

Duration of Study

18 months

Inclusion Criteria

- Patients who are diagnosed as recurrent urinary tract infection
- Age group 15 to 50 years.

Exclusion Criteria

- Diabetes mellitus
- Pregnancy
- Nephrolithiasis
- Renal failure
- BPH

Sample Size

30 patients fulfilling the inclusion and exclusion criteria were selected for the study.

Sampling Technique

Consecutive cases

Collection of Data

Data from an individual case sheet perform specifying demographical data, general history, clinical history related to urinary tract infection,

physical examinations, laboratory investigation, data related with treatment and its response were collected. A consultation and examination was performed to grade the signs and symptoms. Grading was done before and after treatment.

Routine blood investigation including erythrocyte sedimentation rate (ESR) and data related to presence of pus cells in urine were also collected.

Treatment Methodology

The 30 patients who were diagnosed as recurrent urinary tract infection had undergone following treatment procedure.

- Hot hip bath
- Abdominal Hot compress
- Juice therapy
- Diet

1. Hot hip bath

The patients were subjected to hot hip bath in the morning. They were asked to drink one or two glass of water before taking treatment. The hip bathtub was filled with hot water having temperature of 98°F – 104°F. Water was enough to cover the hips and reaching up to the navel of the patients. The patients were asked to sit comfortably in hip bath tub. During the treatment, a cold compress was placed over their head in order to prevent over heating of head. The duration of hot hip bath was about 10 minutes. After hot hip bath, the patient was advised to take rest for about half an hour.^[3] This process was done till the symptom subside.

2. Abdominal hot compress

The patients who had abdominal pain were subjected to hot compress. A cotton cloth was dipped in hot water and wrung out to remove the excess water. It was wrapped around the abdomen of patient from lower part of the ribs up to the groin. Over that, a dry cloth was wrapped to prevent circulation of air and to maintain body heat.^[4] The duration of the application was one hour.

3. Juice therapy

Juice of *Kusmanda* was freshly prepared and it was mixed with paste of *Punarnava*. That juice was given to all patients.

Dosage: Juice - 1 ounce
 Paste - 5-10 g.

4. Diet

The patients were advised to follow modified diet chart which include more alkaline food and avoid non vegetarian diet.^[6]

The patients took naturopathic modalities for 21 days or till the symptoms subside, whichever was earlier. The patients were advised to take more amount of water, to follow proper hygiene and to evacuate the bladder frequently during the course of treatment.

Follow Up

The patients were asked to report after 3 month to check whether there was recurrence of complaints.

Assessment of response to treatment

The patients were assessed subjectively and objectively before and after the treatment. The subjective symptoms were assessed by using scoring method. The symptoms taken for assessment were painful micturition, burning sensation during micturition, frequent micturition etc. the initial and final assessment after 3 weeks were taken for the statistical analysis.

The scoring of symptoms were,

- Absent (0) - No symptoms
- Mild (1) - Mild symptoms
- Moderate (2)- Severe, but tolerable
- Severe (3) - Symptoms hard to tolerate, might interfere with activities of daily living

Laboratory parameters

ESR count and urine analysis were done before and after treatment and they were also taken for comparison.

Research technique

Interrogation, observation, blood and urine investigation were used as research techniques.

Data Analysis

In the present study, the data collected was entered in to a master sheet and statistical tables were

constructed. The data were analyzed before and after treatment using Wilcoxon signed rank test and paired ‘t’ test. The data were interpreted after estimating the mean and standard deviation of quantitative variables and after computing percentage in case of qualitative variables.

Ethics review

Study got permission from ethical committee of Govt. Ayurveda College, Thiruvananthapuram. An informed consent was taken from the subject. They were explained that no side effects have been reported by the administration of naturopathic modalities. Those who gave their consent were included in the study.

OBSERVATIONS AND RESULTS

The score of the clinical features obtained from each patient were compiled in a master sheet and statistical tables were constructed with the help of computer analysis.

In this study 30 patients were selected. The data collected were categorized into following headings.

- Demographic data
- Data related to the disease
- Data related to the response to treatment

Demographic data

Table 1: Distribution of Patients according to Age.

Age in years	N	%
20-30	8	26.67
30- 40	7	23.33
40-50	15	50
Total	30	100

Table 2: Distribution of Patients according to Sex.

Sex	N	%
Male	11	36.67
Female	19	63.33
Total	30	100

Table 3: Distribution of Patients according to Education

Education	N	%
Illiterate	1	3.33
School	9	30.00

Graduate	16	53.33
Professional	4	13.33
Total	30	100

Table 4: Distribution of Patients according to Marital Status.

Marital Status	N	%
Married	25	83.33
Unmarried	5	16.67
Total	30	100

Table 5: Distribution of Patients according to Domicile.

Domicile	N	%
Urban	22	73.33
Rural	8	26.66
Total	30	100

Table 6: Distribution of Patients according to Sleep

Sleep	N	%
Disturbed	18	60
Sound	12	40
Total	30	100

Table 7: Distribution of Patients according to Appetite

Appetite	N	%
Increased	4	13.33
Normal	14	46.67
Decreased	12	40
Total	30	100

Table 8: Distribution of Patients according to Bladder

Bladder	N	%
Normal	4	13.33
Decreased	26	86.67
Total	30	100

Table 9: Distribution of Patients according to Diet

Diet	N	%
Veg	7	23
Non veg	23	77
Total	30	100

Data related to response of treatment

1. Comparison of subjective assessments

Table 10: Effectiveness of treatment on Dysuria

Dysuria	BT		AT		AF	
	N	%	N	%	N	%
No complaints	5	16.67	2	90	2	96.67
Mild	14	46.67	3	10	1	3.33
Moderate	10	33.33	0	0	0	0
Severe	1	3.33	0	0	0	0
Total	30	100	3	100	3	100
Wilcoxon signed rank test(BT)			z	4.54	4.51	
			p	<0.001	<0.001	

Table No 11: Effectiveness of treatment on Pain during Micturition

Pain during micturition	BT		AT		AF	
	N	%	N	%	N	%
No complaints	1	3.33	2	83.33	2	93.33
Mild	9	30.00	5	16.67	2	6.67
Moderate	19	63.33	0	0	0	0
Severe	1	3.33	0	0	0	0
Total	30	100	3	100	3	100
Wilcoxon signed rank test(BT)			z	4.85	4.89	
			p	<0.001	<0.001	

Table 12: Effectiveness of treatment on Low Back Ache

LBA	BT		AT		AF	
	N	%	N	%	N	%
No complaints	11	36.67	2	86.67	2	86.67
Mild	11	36.67	4	13.33	4	13.33
Moderate	4	13.33	0	0	0	0
Severe	4	13.33	0	0	0	0
Total	30	100	3	100	3	100

			0		0
Wilcoxon signed rank test(BT)	z		3.95		3.95
	p		<0.001		<0.001

Table 13: Effectiveness of treatment on Burning sensation during Micturition

Burning Sensation	BT		AT		AF	
	N	%	N	%	N	%
No complaints	0	0	2	83.3	2	93.3
Mild	7	23.3	5	16.6	2	6.67
Moderate	18	60.0	0	0	0	0
Severe	5	16.6	0	0	0	0
Total	30	100	3	100	3	100
Wilcoxon signed rank test(BT)	z		4.95		4.92	
	p		<0.001		<0.001	

Table 14: Effectiveness of treatment on Frequency of Urination

Frequency	BT		AT		AF	
	N	%	N	%	N	%
No complaints	0	0	2	70	2	86.6
Mild	5	16.6	9	30	4	13.3
Moderate	17	56.6	0	0	0	0
Severe	8	26.6	0	0	0	0
Total	30	100	3	100	3	100
Wilcoxon signed rank test(BT)	z		4.89		4.90	
	p		<0.001		<0.001	

Table 15: Effectiveness of treatment on Abdominal pain

Abdominal Pain	BT		AT		AF	
	N	%	N	%	N	%
No complaints	15	50	28	93.33	29	96.6
Mild	12	40	2	6.67	1	3.33
Moderate	2	6.6	0	0	0	0
Severe	1	3.33	0	0	0	0
Total	30	100	30	100	30	100
Wilcoxon signed rank	z		3.69		3.63	

test(BT)	p	<0.001	<0.001
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Table 16: Effectiveness of treatment on Fever

Fever	BT		AT		AF	
	N	%	N	%	N	%
No complaints	17	56.6	3	10	2	96.6
Mild	13	43.3	0	0	1	3.33
Total	30	100	3	100	3	100
Wilcoxon signed rank test(BT)	z		3.61		3.46	
	p		<0.001		<0.001	

Table 17: Effectiveness of treatment on Colour of urine

Colour	BT		AT		AF	
	N	%	N	%	N	%
Abnormal	23	76.6	4	13.3	4	13.3
Normal	7	23.3	2	86.6	2	86.6
Total	30	100	3	100	3	100
Wilcoxon signed rank test(BT)	z		4.36		4.36	
	p		<0.001		<0.001	

2. Comparison of Objective Assessments

Table 18: Effectiveness of treatment on systolic blood pressure

SB P	N	Mean	SD	Paired comparison with BT	
BT	30	121.5	10.7	t	p
AT	30	115.6	9	10.11	<0.001
AF	30	114.4	8.51	9.25	<0.001

Table 19: Effectiveness of treatment on Diastolic blood pressure

DBP	N	Mean	SD	Paired comparison with BT	
BT	30	75.87	7.26	t	p
AT	30	75.6	7.07	1.68	0.10
AF	30	75.33	6.77	2.28	0.03

Table 20: Effectiveness of treatment on ESR

ESR	N	Mean	SD	Paired comparison with BT	
				t	p
BT	30	27.4	12.63		
AT	30	17.67	7.17	8.025	<0.001
AF	30	14.17	4.54	8.122	<0.001

Table 21: Effectiveness of treatment on Pus in Urine

Pus	N	Mean	SD	Paired comparison with BT	
				t	p
BT	30	7	4.28		
AT	30	0.63	0.93	9.88	<0.001
AF	30	0.23	0.43	8.95	<0.001

Table 22: Effectiveness of treatment on Epithelial cells in Urine

Epithelial Cells	N	Mean	SD	Paired comparison with BT	
				t	p
BT	30	3.93	2.65		
AT	30	0.53	0.73	7.85	<0.001
AF	30	0.37	0.56	7.86	<0.001

Table 23: Effectiveness of treatment on RBC in Urine

RBC	N	Mean	SD	Paired comparison with BT	
				t	p
BT	30	1.77	1.96		
AT	30	0.07	.25	4.91	<0.001
AF	30	.07	.25	4.91	<0.001

DISCUSSION

Approximately 40 percent of women and 12 percent of men will experience at least one symptomatic urinary tract infection during their lifetime. Symptoms of UTI include dysuria, pain during micturition, burning sensation during micturition, abdominal pain and fever. The present study shows the effect of

Naturopathic modalities in the management of Recurrent urinary tract infection.

The present study was conducted at OPD of Swasthavriha Department, Govt. Ayurveda College, Trivandrum. Thirty patients who were diagnosed as urinary tract infection were selected for the study and administered naturopathic treatments. In this study, the naturopathic modalities selected for the management of recurrent urinary tract infection were Hot hip bath, Juice therapy, Abdominal hot compress and a modified diet chart. The patients took naturopathic modalities for 21 days or till the symptoms subside, whichever was earlier.

The study was a before and after Quasi – experimental or Non- randomized design. They were analyzed on the basis of certain classical parameters described in the methodology. The patients were classified according to age, marital status, domicile, economic status etc.

On analysis of the demographic data, 26.67 % of patients were at the age group of 20 - 30yrs, 23.33 % of patients were the age group of 30 - 40yrs and majority of patients (about 50 %) were at the age group of 40 – 50yrs. This is because as the age increases, the immunity of the body decreases and is more prone to the UTI. In case of females, women who have gone through menopause have a change in the lining of the vagina and lose the protective effects of estrogen that make it more vulnerable to infection.

In case of sex, about 63 % of patients were females even though no sex discrimination was considered. In women, the ascend of organism into the bladder is easier than in men because of the relative short urethra and absence of bactericidal prostatic secretions. Due to this, UTI are more prevalent among females.

In the present study, 76.67 % of patients were Hindus, 10 % were Muslim and 13.33 % were Christians. This is due to their increased proportion in the society, as no linking of religion with this disease is established.

While considering marital status, 83.33 % of patients were married. This is due to the unhygienic sexual intercourse and Sexual intercourse may cause minor urethral trauma and transfer bacteria from the perineum into the bladder.

When the distribution according to area was considered, the majority of patients were from urban areas, when the education status was studied, it is observed that more patients were graduate. While considering occupation, it was found that majority of the patients were office workers which may probably due to the busy working hours, there will be reduction in intake of water and have a tendency to suppress the urge of micturition.

When socioeconomic status was considered, majority of the patients belongs to the middle class. It was observed that majority of patients had moderate body built; majority of patients had disturbed sleep. On analyzing the appetite, most of patients had normal appetite and in case of bowel about 53% had normal bowel and 47% had constipated bowel.

In this study, majority of patients had decreased amount of urine and while considering diet, most of the patients were non-vegetarians. Usually these non-vegetarian foods are acidic in nature, so they are more prone to UTI.

For the assessment of the effect of naturopathic modalities, outcome variables were measured and statistically compared using Wilcoxon signed rank test and paired 't' test. The primary outcome variables, ESR in blood, pus cell, epithelial cell and RBC in urine, were recorded before and after treatment and after follow up. The subjective scores were assessed before and after treatment and after follow up. This was done in order to assess the presence of long standing effect of naturopathic treatment; whether there is any recurrence of symptoms after required amount of follow up period.

The subjective scores for 8 symptoms were assessed before and treatment viz. dysuria, pain during urination, low back ache, burning sensation, frequency, abdominal pain, fever and urine colour. After treatment, about 90% of patients had no complaint of dysuria and show a high significance at $p < 0.001$. In case of burning sensation during urination, 83.33% of patients had no complaints after treatment. Similarly the frequency of urination also reduced and about 70% of patients had no symptom of increased frequency. This shows a reduction in both symptom and is highly significant at $p < 0.001$. There was a highly significant reduction in symptoms

like pain during urination ($p < 0.001$), Low back ache ($p < 0.001$), abdominal pain ($p < 0.001$), fever ($p < 0.001$) and colour of urine ($p < 0.001$).

On comparing objective parameters, there was significant reduction in ESR ($p < 0.001$), pus cells in urine ($p < 0.001$), epithelial cell in urine ($p < 0.001$), RBC in urine ($p < 0.001$) and systolic blood pressure ($p < 0.001$). The reduction in diastolic blood pressure was significant at $p < 0.05$.

The proposed follow up period for this study was 3 month during which no meditations were provided, but some self-help advice for patients had given. Both subjective and objective symptoms were scored and statistically analyzed after follow up. The analysis showed that reductions in symptoms after treatment were maintained during the period of follow up. There was reduction of objective parameters like ESR in blood, pus cells, epithelial cell and RBC in urine before treatment and follow up. Both subjective and objective parameters were highly significant at $p < 0.001$. This shows that there was no recurrence of infection during the follow up period.

Thus this analysis shows that naturopathic treatments were very effective in the management of recurrent urinary tract infection and has strong effect on all the symptoms associated with it. This study also showed a clear idea regarding the preventive aspect of naturopathy as the recurrent rate of infection was highly reduced.

Water is the main medium of treatment in naturopathy because of its characteristic of, absorption of body heat. The hot hip bath stimulates the heat receptors of the body and results in the vaso-dilation. This vaso-dilation improves blood flow which in turns increases the supply of nutrients to the tissues and helps in the removal of waste products. Hot water is a stringent and a safe painkiller. It removes pain by eliminating the toxins from the body. It also has the properties of anti-bacterial, anti-inflammatory action and thereby in turns boost up the immune system of the body.^[5] According to Vagbhata, hot water stimulates hunger, helps digestion, well for throat and cleanses the urinary bladder.^[6] Thus this hot hip bath drains out the adhered bacteria from the urinary tract and prevent from further infection.

The drugs used for juice therapy in this study were *Punarnava* and *Kusmanda*. *Punarnava* has diuretic, rujevanative, anti-oxidant, antimicrobial, anti-inflammatory and antispasmodic properties, which are beneficial in treating urinary tract disorders such as chronic and recurrent urinary tract infections (UTIs), including UTI's in pregnancy. The diuretic action of the *Punarnava* is attributed to the presence of the xanthone beta-ecdysone. Due to the rujevenative property of *Punarnava*, it works very well on the urinary system and it targets directly to the damaged nephrons (kidney's basic functional unit) which get damaged during infection. *Punarnava* speeds up the filtration process of kidneys and flushes out the excessive fluids and other waste products.^[7]

The main content of *Koosmanda* is water, but it also contains many a fore mentioned healthy nutrients. Because of its high water content it is one of the best natural diuretics out there. This property of *Koosmanda* is very beneficial for the urinary system, kidneys, bladder, liver and the pancreas too. Due to its anti-oxidant, anti-pyretic and alkaline properties, *Koosmanda* pacifies burning sensation, resulting in fast recovery from disease and more effective cleansing and regenerative of the tissue.^[8]

Abdominal hot compress was recommended for the patients who had abdominal pain. When abdominal hot compress is applied, there occurs an active vaso dilatation, which in turns leads to improved circulation and nutrition to the abdominal organ. Increased circulation causes an increased renal filtration and thus dislodges the bacteria which may be adhering to the vessel wall, thus antagonizing the inflammation.^[9]

Hydration and proper hygiene is the best treatment for recurrent urinary tract infection. Naturopathy holds that a natural whole foods diet is of the highest importance in the maintenance and improvement of health, and that a scientifically-prescribed diet is of the proven method to cure disease. Our diet should be concentrated on more liquid and soft food at the time of infection. A modified diet chart was prepared and given to the patient. Urinary tract infection can be easily prevented by changing our regular diet to more fruit and vegetables.^[10] Thus we all know that Naturopathy is science that deals with treating the disease, using inbuilt capacity of body of balancing

homeostasis condition by maintaining equilibrium between addition of substance and removal of substance. Principles behind achieving the health are to restore the homeostatic condition by regulating diet and excreting toxins from the body.^[11] Diet regulation, proper physical work (exercise, *Asana* and *Yoga*) and treatment modalities of naturopathy particularly hydrotherapy improves defense mechanism.

CONCLUSION

Naturopathy indeed is knowledge of living healthy and improving longevity by conserving body energy. Naturopathy not only helps us in attaining freedom from disease but also help in acquiring positive and vigorous health. Proper intake of water is the primary treatment for urinary tract infection. All the drugs used in the study have diuretic and anti-inflammatory properties and provide good results, hence it is to infer that drugs having diuretic and anti-inflammatory properties are very effective in urinary tract infection. Immunity has an important role in the management of Recurrent Urinary Tract Infection and in preventing the relapse of the disease. The naturopathic modalities including hot hip bath, abdominal hot compress, juice therapy and diet control is found to be therapeutically very effective in reducing the symptoms of urinary tract infection. The naturopathic modalities have better, cost effective and long standing effect on relieving the disease. Statistical analysis from the clinical trial showed that there was significant reduction in ESR in blood, pus cell, epithelial cell and RBC in urine. So it can be concluded from the study that the naturopathic modalities are effective in the management of recurrent urinary tract infection. Study group had minimum recurrence after follow up period substantiating the effect of the treatment protocol in minimizing the recurrence. By modifying our diet and improving proper hygiene, Urinary tract infection is highly preventable.

REFERENCES

1. Nicholas A .Boon, Nicki R. Colledge, BrainR. Walker, John.A, A.Hunter. Davidson's Principle and Practice of Medicine. 20thedition. London; Churchill Livingstone; 2006:467

2. Dr. Mangala Gouri, V.Rao. A Text book of Swasthavritha. 1stedition. Varanasi; Chaukamba Orientalia; 2007:445
3. Sebastian Kneipp. Healing and Treatment of Disease through water. 2nd edition. Delhi; Sri Satguru Publications;1996:47.
4. Dr.J.H.Kellogg. Rational Hydrotherapy. 4threvised edition. Puna; National Institute of Naturopathy; 1918:843.
5. H.K.Bakhru. A complete Handbook of NATURE CURE. 16th Edition. Fort Mumbai; Jaico Publishing House; 2003:322.
6. Prof. K.R. Srikantha Murthy. Vagbhata's Astanga Hrdayam. 1stedition. Varanasi; Chowkhambakrishnadas Academy; 2003:57.
7. Dr.J.L.N.Sastry. Dravyaguna Vijnana. Vol2. 1st edition.Varanasi; Chaukhambha Orientalia; 2010:437
8. Dr.J.L.N.Sastry. Dravyaguna Vijnana. Vol 2. 1stedition.Varanasi; Chaukhambha Orientalia;2010:242
9. M.K.Gandhi. Nature Cure.1st edition. Ahmadabad; Navajivan Publishing House;2002:14.
10. Vijaya Kumar. The Secret Benefits of Juice Therapy.1st edition. Sterling Publishers; Reprint 2011:17.
11. Sathyah, Vijaya Gopalan. Eats and Drinks. 2ndedition. Pudukkottai; Nature cure Publishing House; 1990:23.

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