



Assessment of symptoms on patients with urinary tract infections and adherence to medications

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Article History:

Received on: 11 Apr 2021
Revised on: 14 May 2021
Accepted on: 20 May 2021

Keywords:

Impact,
Medication adherence,
Urinary tract infections,
UTISA

ABSTRACT

Although urinary tract infections (UTIs) are considered to be the most common bacterial infections worldwide, their assessment remains a big clinical challenge, because they are not reportable diseases in developed countries like United States and any other parts of the world including India. This situation is further complicated by the fact that accurate diagnosis depends on both the presence of symptoms and a positive urine culture, although in most outpatient settings this diagnosis is made without the benefit of culture. Our study aimed to appraise the impact of urinary tract infections symptoms on selected patients and comprehend their adherence to medications despite the challenges of antimicrobial susceptibility and resistance observed. One hundred and twenty patients with confirmed cases of urinary tract infections were recruited for the study. The mean age of females and males patients was found to be 59.86 ± 2.37 and 52.27 ± 3 years respectively. Pertinent descriptive and inferential statistics were performed. Spearman correlation test revealed a strong positive correlation between overall UTIs' symptoms and their impact on patients at baseline (0.84) and at follow up (0.799) with p value =0.5. On the other hand the majority of patients were found to be adherent to the medications after discharge. The current study revealed that Urinary tract infections if left untreated can negatively impact the lives of patients suffering from it and hinder their adherence to medications. Consequently, accurate and early assessment of UTIs' symptoms in clinics and hospitals becomes a necessity.

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ISSN: 0975-7538

DOI: <https://doi.org/10.26452/ijrps.v12i3.4776>

Production and Hosted by

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INTRODUCTION

Urinary tract infections (UTIs) represent a collective term of infections that involves any part of the urinary tract such as: the kidneys, ureters, bladder or urethra (Tan and Chlebicki, 2016). These infections can be community acquired or nosocomial infections. Patients diagnosed with confirmed symptomatic UTIs experience different clinical symptoms among which the common ones are: burning sensation during micturition, pain above pubic bone, cloudy urine, foul smell of urine, fever, urgency and frequency of urination, back pain and vomit (Chang et al., 2015). Generally for most of the patients,

the spectrum of the urinary tract infections ranges from asymptomatic bacteriuria to lower urinary tract infection (cystitis), upper urinary tract infection (pyelonephritis) and severe urosepsis.

Though uncomplicated urinary tract infections rarely progress to life-threatening diseases, if left untreated they may lead to marked impairment of the quality of life in women and anyone suffering from it (Hooton, 2012). In fact, the literature search has demonstrated that UTIs are the leading cause of morbidity and health care expenditure in persons of all ages (Betsy, 2002). In India, the global annual incidence is approximately 150 million cases and the estimated economic burden is more than 6 billion U.S dollars. About 40% of women and 12% of men experience at least one symptomatic UTI during their lifetime and as many as 40% of affected women show recurrent UTIs.

Added to that, the empirical treatment which consists of the higher rate of antibiotics prescriptions (beta lactam antibiotics) considerably induces antibiotic resistance therefore worsening the quality of life of patients. It was also observed that the majority of patients experienced poor adherence to medications due to antibiotics resistance

This study was designed to systematically assess the impact of UTIs' clinical symptoms on patients suffering from it and their adherence to medications, thus helping them to abridge the adverse outcomes while promoting their overall health.

MATERIALS AND METHODS

Study Ethics

Ethical approval was obtained from the Institutional Ethics Committee (IEC) of ESIC Medical College & PGIMS and Model Hospital, Rajajinagar, Bengaluru

Subject Recruitment and Study Population

Patients aged 18-60 years with confirmed cases of complicated or uncomplicated urinary tract infections admitted to the in-patient and out-patients clinic of General Medicine Department were included in the study. Patients not consenting to participate in the study or with asymptomatic urinary tract infections and pregnant patients who could not give data were excluded. Informed consent was taken from patients who were incorporated and consented to partake in the study.

Study tool

A Self-designed case report form was used to collect patients' demographic details, history of illness, comorbidities and other relevant information.

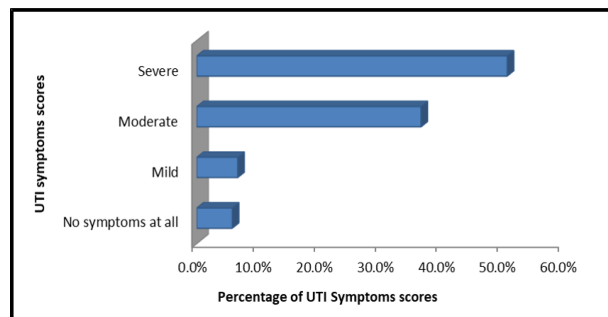


Figure 1: Overall rating of UTI symptoms severity and IOL at baseline

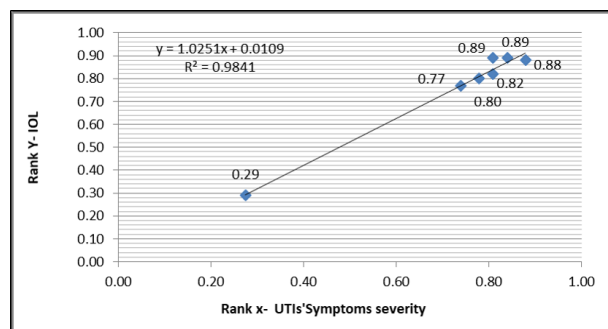


Figure 2: Spearman positive correlation between severity of UTI symptoms and impact on life (IOL) at baseline

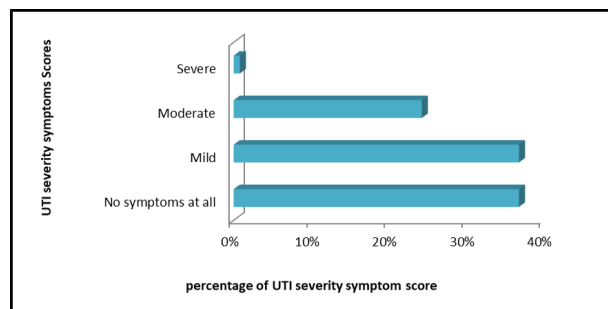


Figure 3: Overall rating of UTI symptoms severity and IOL at follow up

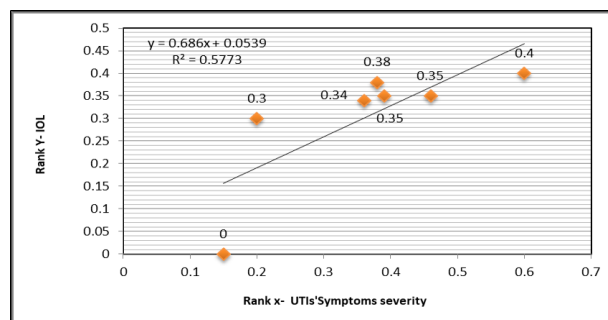


Figure 4: Spearman positive correlation between severity of UTI symptoms and impact on life (IOL) at follow up

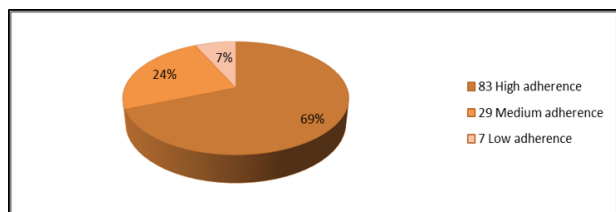


Figure 5: Percentage of adherence to medications

A 14 item self-administered questionnaire known as UTISA (Urinary Tract Infections Symptoms Assessment) questionnaire was used to assess the 'severity' and 'bothersomeness' of the most frequently reported signs and symptoms of uncomplicated and complicated urinary tract infections. It was first developed in English by Bayer pharmaceuticals and used by other researchers (Darren Clayson et al.) and translated in local languages for better understanding of our patients. It consisted of two major parts: the UTISA severity symptoms and the symptoms scores. The UTISA severity symptoms section consisted of seven common symptoms such as: frequency of urination, Urgency of urination, Dysuria, Incomplete bladder emptying, Lower abdominal discomfort, Low back pain and haematuria. The symptoms scores section followed a likert scale pattern including four domains scores namely: don't have, mild, moderate, severe. The score was attributed in such a way that, the higher the score obtained the severe the symptoms and their impacts on patients. The modified UTISA questionnaire was analysed for accuracy, use of jargon, appropriateness, and double-ended questions then evaluated for reliability using cronbach alpha test and a pilot study with 25 random patients and was amended based on the feedback received.

Morisky Green Levine Medication Adherence questionnaire was administered to our patients in order to assess their adherence to medications. Morisky uses a scale consisting of 4 items with a scoring scheme of yes =1 and no=0. The items were summed to give a range of scores from low adherence to high adherence.

Data analysis

Information gathered for this study was encrypted and recorded in a spreadsheet. Statistical analysis was performed using MS excel and other online mathematical calculators. All statistics were considered significant if the p-value was less than 0.05

RESULTS AND DISCUSSION

The study included 120 patients for whom the mean age was found to be 59.86 ± 2.37 years for females

and 52.27 ± 3 years for males. Complicated UTIs were found to be the widely recognized diagnosis 92 (76.7%), followed by uncomplicated UTIs 21 (17.5%), recurrent UTIs 6 (5.0%), and only few with nosocomial UTIs 1 (0.8%).

To comprehend the impact of UTIs on patients' lives, the UTISA questionnaire was administered to the patients both at baseline and follow up visit. At baseline (first day of admission) the findings revealed that dysuria (58.3%) was the most severe and common symptom, followed by lower abdominal discomfort (51.7%) and Hematuria with (5.8%). In terms of symptoms related impact, dysuria (60.8%) was found to have affected the life of patients in a greater matter at the difference of all other symptoms as presented in Table 1.

At the end of the first visit the overall rating of symptoms severity experienced by the 120 patients was assessed and the majority of patients 61 had severe symptoms (50.8%), whereas only 7 patients had no symptoms at all (5.8%) as shown in Figure 1. Spearman correlation test was performed at baseline, the value was found to be: 0.8454 and the corresponding graph portrayed an increasing monotonic trend between the severity of UTIs symptoms and their impact. This implies the strong positive correlation between the UTIs symptoms severity and their impact on the patients' lives as represented in Figure 2. This finding is similar to that obtained by (Clayson, 2005) and (Chang et al., 2015).

The UTISA questionnaire was re-administered to the patients three days after admission (follow up) to evaluate any improvement in their conditions and find out the responsible factors of these improvements. The results showed that none of the 120 patients complained of dysuria, whereas only 4.2% complained of frequency of urination. The mean total symptom score of the severity of UTIs' symptom decreased considerably from: 44.22 ± 14.06 at baseline to 11.7 ± 1.77 ($p < 0.05$) at follow up indicating thus a decrease in the severity of symptoms at follow up as compared to the baseline. A similar finding was obtained from (Chang et al., 2015) in which the symptom score of the severity of symptoms decreased significantly from 9.8 ± 4.7 to 2.9 ± 3.5 ($p < 0.01$) after one week of antibiotics treatment.

With regards to the symptoms related impact on patients' life the mean total impact symptom score decreased from 38.44 ± 11.88 at baseline to 1.05 ± 1.0 at follow up. The highest frequency of impact related symptom severity was found to be: (2.5%), followed by (0.8%) and (0.00%) being the least observed frequency as shown in Table 2.

The results obtained at follow up (after the anti-

Table 1: Severity of UTI symptoms and their impact on patients' life at baseline

UTISA ques- tion No.	UTISA related impact symp- toms on life(IOL)	Impact symptoms scores			
		Don't have	Mild	Moderate	Severe
1	Urinary frequency related IOL	18.3%	13.3%	28.3%	40%
2	Urgency related IOL	15.8%	17.5%	29.2%	37.5%
3	Dysuria related IOL	11.7%	9.2%	18.3%	60.8%
4	Incomplete bladder emptying related IOL	21.7%	18.3%	25.0%	35.0%
5	Lower abdominal discomfort related IOL	18.3%	10.0%	22.5%	49.2%
6	Low back pain related IOL	25.8%	14.2%	19.2%	40.8%
7	Hematuria related IOL	70.8%	10.0%	11.7%	5.8%
Mean of total impact symptoms scores		26.05±7.34	13.21±2.34	22.02±5.66	38.44±11.88

Table 2: Severity of UTI symptoms and their impact on patients' life at follow up

UTISA question No.	UTISA related impact symp- toms on life(IOL)	Impact symptoms scores			
		Don't have	Mild	Moderate	Severe
1	Urinary frequency related IOL	60%	22.5	15.0	2.5%
2	Urgency related IOL	65.0%	20.0%	15.0%	2.5%
3	Dysuria related IOL	65.0%	23.3%	11.7%	0.0%
4	Incomplete bladder empty- ing related IOL	70.0%	20.0%	9.2%	0.8%
5	Lower abdominal discom- fort related IOL	64.2%	22.5%	12.5%	0.8%
6	Low back pain related IOL	65.8%	20.0%	13.3%	0.8%
7	Hematuria related IOL	100%	0.0%	0.0%	0.0%
Mean of total impact symptoms scores		70 ± 23.33	18.32 ± 4.27	10.95 ± 1.49	1.05 ± \$

biotherapy) demonstrated a noteworthy improvement in patients' conditions. In fact, the majority of them (36.07%) experienced no symptoms at all, whereas only few reported UTIs symptoms bothersomeness as shown in Figure 3.

This study is comparable to the original study of UTISA done by Darren Clayson et al where the estimated MID (mean in difference in the measure associated with the smallest detectable symptom improvement) values also reflected the greater improvement in symptoms immediately after treatment, being greater initially than after a few hours of treatment. Spearman correlation test was again performed at follow up, the value was found to be: 0.5773 and the corresponding graph portrayed an increasing monotonic trend between the severity of UTI symptoms and their impact. Consequently,

indicating a strong positive correlation between the variables. This is portrayed in Figure 4.

The medication adherence was assessed at follow up to check how adherent the 120 patients were to their medications prescribed. The results revealed that more than half of the patients 83 (69%) were found to be highly adherent to the medication, 29 of them(24%) were found to be medium adherent and only 8 patients (7%) were found to be low adherent as represented in Figure 5.

In this study, the adherence to medication was assessed after the patients have been discharged from the hospital through phone call. In contrast, (Philips, 2014) study was much emphasized on physician being much adherent to the standard guidelines for UTIs treatment.

CONCLUSION

This study revealed that though UTIs can be uncomplicated they may also be associated with symptoms that are severe in nature. Our findings also demonstrated by means of statistical analysis the correlation between the severity of UTI symptoms and their impact on patients' life. In other words, UTIs can drastically impact the life of patients suffering from it if no early precautions are taken.

The above parameters feature the need for enhancing accurate assessment of UTIs symptoms in patients to reduce their impact and improve the quality of life of patients. Simple hygienic routine such as: avoiding public toilets, wiping from front to back, avoiding unclean areas and clinical activities such as patient counselling, medication review, and pharmaceutical care program can be of a great help in reducing the severity of UTIs' symptoms and their subsequent impact.

ACKNOWLEDGEMENTS

We express our heartfelt gratitude to Dr Gangabaraiah A, Professor of Statistics, Department of Community Medicine, Kempegowda Institute of Medical Science, Bengaluru, for his contribution to the statistical analysis of our study. We also stretch out our sincere appreciation to Mr Binai K Sankar, Assistant Professor, Pharmacy Practice Department for his helpful direction in achieving this work.

Conflict of interest

The authors declare that they have no conflict of interest for this study.

Funding Support

The authors declare that they have no funding support for this study.

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