

## Original Article

# Determining Score and Comparing Knowledge of Medical Interns about Renal Colic

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## HIGHLIGHTS

- This study was to compare the level of knowledge of medical interns who have gone through the urology course.
- This study was to compare the level of knowledge of medical interns who have gone through the urology course.
- The interns who have a higher level of knowledge about renal colic.

## ARTICLE INFO

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## ABSTRACT

### Introduction

This study was conducted to compare the level of knowledge of medical interns who have gone through the urology course during their externship with interns who have not gone through the urology course during their externship.

### Methods

In this cross-sectional study that was conducted in the year 2021 at the Isfahan University of Medical Sciences, Isfahan, Iran, 97 medical interns entered in September 2014, 38 of whom underwent a neurosurgery course and 59 underwent a urology course and the level of public awareness about renal colic It was studied in them.

### Results

The total evaluation score in the neurosurgery group was  $71.79 \pm 13.93$  and the urology group was  $85.83 \pm 7.19$ , and the students who completed the urology course were significantly higher than the average ( $P$ -value  $< 0.001$ ). The average percentage of correct answers to questions in the field of differential diagnosis was  $25.39 \pm 4.55$ , the field of use of painkillers was  $78 \pm 19.77$ , and the field of emergency intervention was  $83.3\% \pm 18.41$  in all students. The average percentage of correct answers to the differential diagnosis questions in the neurosurgery and urology groups was  $22.5 \pm 5.15$  and  $27.25 \pm 2.9$ , respectively, and the difference between the two groups was significant ( $P$ -value  $< 0.001$ ).

### Conclusions

The findings of the present study show that the medical students who completed the urology course during the externship have a higher level of knowledge about renal colic than the students who completed the neurosurgery course.

**Keywords:** Extern; Medical Student; Renal Colic

## Introduction

Diseases of the nervous and renal system are among the most common reasons for referring to doctors' offices and general practitioner and specialist clinics, and among these diseases, intervertebral disc herniation and renal colic can be mentioned. Back pain is one of the major public health problems, and based on studies, it is the second cause of absenteeism after colds (1). On the other hand, renal colic, the main cause of which is kidney stones, affects about 11-16% of men and 7-8% of women up to the age of 70. (2,3) Also, renal colic affects about

12% of It affects the population (4) and accounts for about one percent of emergency room visits and about one percent of all hospital admissions (5).

Renal colic is one of the important morbidities of urolithiasis. Renal colic is a recurring condition in the form of very severe and sudden pain that has a significant impact on the quality of life (6,7).

Despite the high prevalence of the mentioned two diseases in Iranian society, several years ago, the urology course was removed from the internship stage and transferred to the externship stage (student step 2).

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One of the problems following this decision is the lack of a therapeutic approach in external students, which limits professors in teaching therapeutic approaches to students. Also, with this decision, every year only half of the external students are required to pass the urology section and the other half have the neurosurgery section in their educational program. These cases may affect the knowledge about treatment approaches in general medicine graduates. Therefore, this study was conducted with the aim of comparing the level of knowledge of medical interns who have gone through the urology course during their externship with interns who have not gone through the urology course during their externship.

### Methods

The current research is a cross-sectional study that was conducted in the year 2021 at Isfahan University of Medical Sciences. The target population of the study was medical interns entering Isfahan University of Medical Sciences in September 2014. This study was approved by the ethics committee of Isfahan University of Medical Sciences, Isfahan, Iran (IR.MUI.MED.REC.1399.720).

The criteria for entering the study included: studying in the medical internship course of Isfahan University of Medical Sciences, entry in September 2014, and the student's consent to participate in the study. Also, medical interns who provided incomplete answers or selected multiple options for a question in the questionnaire were excluded from the study.

Sampling was based on a census and all the medical interns entering September 2014 Isfahan University of Medical Sciences, who were 131 people, were invited to the study, among them, 101 people participated in the study and 4 people due to incomplete answers to the questions or selection Multiple options for each question were excluded.

The data collection tool was a researcher-made questionnaire that was prepared with the help and participation of professors of the Urology Department of Isfahan Medical School. This questionnaire contains 25 questions about renal colic, which measures the level of awareness of patients in three areas: differential diagnosis (14 questions), indications for emergency intervention (5 questions), and indications for the use of painkillers (6 questions). The options for each question were designed

on a 5-point Likert scale. The options included true, probably true, don't know, false, and completely false, with a score of 0 to 4 depending on whether the question was true or false. In this way, the total score of each questionnaire is 100, and scores above 75 are considered as good awareness, 51-75 as average awareness, 26-50 as poor awareness, and less than 25 considered very poor awareness.

To check the validity of the questionnaire, the questionnaire was given to 7 faculty members of the urology department and students to check the questions. To check the quality of the content, they were asked to provide the necessary feedback related to the questionnaire, and based on that, corrections were made. Also, two coefficients of content validity relative (CVR) and content validity index (CVI) were used to quantitatively check content validity. This process was done for each question and finally, the questionnaire was modified.

To check the reliability of the questionnaire, first, the questionnaire was given to 20 interns and the answers were collected. Then, after two weeks, the questionnaire was given to the same 20 interns again and the answers were collected again the obtained scores were analyzed by test-retest method and their correlation coefficient was calculated. Also, Cronbach's alpha coefficient was checked to measure the reliability of the questionnaire, and after the necessary corrections, the alpha value was 0.806.

Questions 1 to 14 of the questionnaire are about the differentiation of renal colic and musculoskeletal pain. Questions 18, 20 23, and 25 are indications for the use of opioid painkillers and NSAIDs. Questions 15 to 17, 19, and 24 are about the indications for emergency intervention and facilitating stone removal.

The questionnaire was provided electronically to the interns who were willing to cooperate. Then the answers were collected and their points in each subject as well as the overall points were determined.

Finally, the data was entered into SPSS version 26 software and analyzed with a T-test, Mann-Whitney, Pearson correlation test, and linear regression test at a significance level of  $P\text{-value} > 0.05$ .

**Table 1.** Distribution of demographic variables of neurosurgery and urology groups

Variable	Course Completed		P-value
	Urology	Neurosurgery	
Sex	Male	26 (44.1)	0.85
	Female	33 (55.9)	
GPA average	17.27 $\pm$ 1.31	16.93 $\pm$ 1.3	0.09

**Table 2.** Mean and standard deviation of the evaluation score in the three areas of differential diagnosis, use of housing, and indications for emergency intervention

Variable	Course Completed		P-value
	Urology	Neurosurgery	
Differential diagnosis of renal colic and musculoskeletal pain	48.66 $\pm$ 5.17	40.18 $\pm$ 9.18	0.001
Indications for the use of opioid analgesics and NSAIDs	14.97 $\pm$ 3.1	16.63 $\pm$ 4.31	0.001
Indications for emergency intervention and facilitation of stone removal	17.41 $\pm$ 2.93	15 $\pm$ 3.1	0.001

**Table 3.** Distribution of the frequency of correct answers to questions in the urology course

Area	Questions	Number and percentage of Correct Answers		P-value
		Neurosurgery	Urology	
Differential Diagnosis	Renal colic starts from the flank and spreads to the groin (correct)	2(84.7)	54(91.5)	0.70
	Renal colic improves with rest. (False)	21(55.3)	55(93.2)	0.001
	Renal colic occurs mostly unilaterally (correct)	35(92.1)	51(86.4)	0.38
	Renal colic is periodic in nature (correct)	25(65.8)	48(81.4)	0.10
	Renal colic never involves the scrotum or labia majora. (False)	23(60.5)	54(91.5)	0.001
	If the pain is continuous, it is a rejection of renal colic. (False)	18(47.4)	52(88.1)	0.001
	Renal colic pain probably varies according to the location of the stone and its migration. (correct)	31(81.6)	50(84.7)	0.68
	Renal colic is cured by folding the knees in the abdomen (wrong)	32(84.2)	46(78)	0.45
	The presence of hematuria along with flank pain rules out renal colic. (False)	20(52.6)	46(78)	0.009
	Renal colic cannot be accompanied by irritative symptoms (dysuria and frequency) (wrong)	37(97.4)	57(96.6)	0.83
	Renal colic is usually not accompanied by nausea and vomiting. (False)	27(71.1)	54(91.5)	0.008
	Renal colic can start a few days ago (correct)	27(71.1)	51(86.4)	0.06
	Renal colic causes restlessness and does not improve with any position (correct).	30(78.9)	49(83.1)	0.61
	In abdominal examination, there is no tenderness and rebound tenderness in a patient with renal colic. (correct)	29(76.3)	54(91.5)	0.037
Emergency intervention and facilitation of stone removal	<p>In this patient, an emergency consultation should be done to remove the obstruction and drainage of the urinary system (correct).</p> <p>A 24-year-old woman was referred due to right kidney colic pain with burning and urinary retention. In the examination, the patient's temperature is 39 degrees Celsius and there is tenderness of the right vertebral rib angle. Urine test showed clear pyuria, and in ultrasound, a 5 mm diameter stone was reported at the end of the right ureter along with mild hydronephrosis.</p>	31(81.6)	51(86.4)	0.52
		34(89.5)	52(88.1)	0.84
		25(65.8)	57(96.6)	0.001
	Oliguria with renal colic is an indication for hospitalization. (correct)	28(73.7)	52(88.1)	0.07
	The presence of bilateral hydronephrosis during renal colic is not an indication for hospitalization and emergency intervention. (False)	27(71.1)	47(79.7)	0.33
Indications for the use of opioid analgesics and NSAIDs	The NSAID of choice for pain control in renal colic is intravenous ketorolac. (correct)	25(65.8)	44(74.6)	44(74.6)
	Opioids can be used to control pain in renal colic. (correct)	21(55.3)	40(67.8)	0.21
	NSAIDs can be used to control pain in renal colic. (correct)	2(73.7)	56(94.9)	0.003
	To control the pain in renal colic, morphine with a dose of 5 mg IM can be used. (correct)	33(86.8)	46(78)	0.27
	To control the pain of renal colic, NSAIDs and opioids can be prescribed together. (correct)	24(63.2)	56(94.9)	0.001
	Diclofenac suppositories can be used to control pain in renal colic. (correct)	3(78.9)	51(86.4)	0.33

## Results

In this study, 97 medical interns who entered in September 2014 participated in the study, 38 (39.2%) of them had

completed the neurosurgery course and 59 (60.8%) had completed the urology course. 42 (43.3%) students were male and 55 (56.7%) were female. The frequency of males in the neurosurgery and urology groups was

16 and 26, respectively (42.1% vs. 44.1%) and there was no significant difference between the two groups ( $P$ -value=0.85).

The average GPA of all students was  $17.14 \pm 1.31$  and in the neurosurgery and urology groups, it was  $16.93 \pm 1.3$  and  $17.27 \pm 1.31$ , respectively, and there was no significant difference between the two groups ( $P$ -value=0.23) (Table 1).

The average total evaluation score of the studied students was  $80.33 \pm 12.39$  with a range of 46-98 from the maximum score of 100. This average was  $71.79 \pm 13.93$  in the neurosurgery group and  $85.83 \pm 7.19$  in the urology group, and according to the  $t$ -test, the students who completed the urology course had a significantly higher average score ( $P$ -value<0.001).

According to the obtained results, among the 97 studied students, 73 people (75.3%) had a favorable level of knowledge about renal colic, 17 of them were from the neurosurgery group and 56 from the urology group (44.7% versus 94.9%). Also, 20 people (20.6%) had a medium level of knowledge, 18 people from the neurosurgery group and 2 people from the urology group (47.4% vs. 3.4%). 4 students (4.1%) also had a poor level of awareness, 3 of them were from the neurosurgery group and 1 from the urology group (7.9% versus 1.7%). Performing Fisher's exact test on the mentioned data also showed that the students who completed the urology course had a significantly higher level of knowledge ( $P$ -value<0.001).

Table 2 shows the mean and standard deviation of the evaluation score in the three fields of differential diagnosis of renal colic and musculoskeletal pain, indications for the use of opioid painkillers and NSAIDs, and indications for emergency intervention and facilitation of stone excretion. According to Table 2, in all three mentioned areas, the students who completed the urology course during the internship had significantly more knowledge.

The average percentage of correct answers to questions in the field of differential diagnosis was  $25.39 \pm 4.55$ , the field of use of painkillers was  $78 \pm 19.77$ , and the field of emergency intervention was  $83.3\% \pm 18.41$  in all students. The average percentage of correct answers to the differential diagnosis questions in the neurosurgery and urology groups was  $22.5 \pm 5.15$  and  $27.25 \pm 2.9$ , respectively, and the difference between the two groups was significant ( $P$ -value<0.001). Regarding the use of painkillers to relieve renal colic, the average percentage of correct answers was  $70.61 \pm 23.71$  in the neurosurgery group and  $82.77 \pm 15.15$  in the urology group, and the difference between the two groups was significant ( $P$ -value=0.003). Also, the average percentage of correct answers in the field of emergency intervention was  $76.32 \pm 18.52$  in the neurosurgery group and  $87.8 \pm 17.03$  in the urology group, and the difference between the two groups was significant ( $P$ -value=0.002).

Table 3 shows the distribution of the frequency of correct answers to the questions raised in the field of renal colic. According to the mentioned Table, in the field of differential diagnosis, out of 14 questions, in 6 questions, there was a significant difference between the two groups, and the frequency of correct answers was higher in the group that went through the urology course. In the field of emergency intervention and facilitating stone removal, out of the 5 questions asked, only in 1 case, the difference between the two groups was significant, and the number of correct answers was significantly higher in urology students. In the area of indications for the use of painkillers, out of the 6 questions asked, in two cases, the correct response rate of the urology group was significantly higher. In other questions, no significant difference was observed between the two groups.

Examining the scores of male and female students were  $78.93 \pm 13.63$  and  $81.4 \pm 11.37$ , respectively, and no significant difference was observed between the two genders ( $P$ -value=0.33). Also, there was a direct correlation of 0.13 between the evaluation score and the GPA of students, which was not significant according to the Pearson test ( $P$ -value=0.20). Performing a linear regression test on the mentioned data also showed that, among the three variables, the type of course taken during the internship period, gender, and grade point average, only the variable of the type, of course, was effective on the score ( $P$ -value<0.001) and the two variables of gender ( $P$ -value=0.19) and grade point average ( $P$ -value=0.60) had no significant effect on the changes of the mentioned score.

## Discussion

This study was conducted to compare the level of knowledge of medical interns who have gone through the urology department during their externship with interns who did not go through the urology department during their externship.

The findings of the present study showed that the medical interns who completed the urology course during the externship had a higher level of awareness about differential diagnosis, emergency intervention, and the use of painkillers for relief than the students who undertook the neurosurgery course. The pains were renal colic. In this regard, although a similar study has not been done so far that has examined the level of awareness based on whether or not to attend a urology course, Forsythe, in a study he conducted on 50 medical students, assessed their level of awareness in the field of urology, has evaluated it as unfavorable and concluded that due to the high number of patients with renal colic, medical students need to increase the level of awareness and develop training in the field of urological diseases (8). In another study conducted by Patel et al., they examined the level of awareness of 108 medical students of a hospital before

and after the mandatory urology rotation. The findings of the mentioned study have shown that the mandatory rotation of urology has led to more favorable management of patients, increased interest in the subject of urology, and increased skill in the field of diagnosis and treatment of urology patients, and has led to a favorable experience for students (9).

According to the findings of the study, the level of awareness of the students was higher in the field of emergency intervention and in this regard, the students who completed the urology course gave more correct answers to the questions in all three fields. Therefore, considering the high prevalence and importance of kidney stones and the need for proper management and emergency treatment of renal colic pains, it seems that it is necessary for all medical students during urology, even though neurosurgery diseases are also important and prevalent. but the comparison of the most common diseases in neurosurgery and urology, which includes back pain due to intervertebral disc herniation and renal colic, shows that patients with renal colic have higher pain intensity and require emergency intervention. On the other hand, the type of pain management in renal colic as well as the correct diagnosis of the disease is very important.

### **Conclusions**

The findings of the present study show that the medical students who completed the urology course during the externship have a higher level of knowledge about renal colic than the students who completed the neurosurgery course. Therefore, considering the higher severity of pain in renal colic and the need for emergency intervention, it seems that it is necessary for all medical students during urology.

### **Authors' contributions**

HS wrote the paper. RK and NS treated the patients. RK and HS followed the patients. RK and HS, reviewed samples. HM and NS search the Literature; RK collect and processing the Data; RK and BKH helped in writing draft.

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Not Applicable.

### **Conflict of interest**

All authors declare that there is no conflict of interest.

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There was no funding.

### **Ethics statement**

This study was approved by the ethics committee of Isfahan University of Medical Sciences, Isfahan, Iran (IR.

MUI.MED.REC.1399.720).

### **Data availability**

Data will be provided on request.

### **Abbreviations**

CVI Content validity index

CVR Content validity relative



## References

1. Speed C. Low back pain. *BMJ* 2004 May; 328: 1119-1121.
2. Scales CD Jr, Smith AC, Hanley JM, Saigal CS; Urologic Diseases in America Project. Prevalence of kidney stones in the United States. *Eur Urol*. 2012;62(1):160-165.
3. Shoag J, Tasian GE, Goldfarb DS, et al. The new epidemiology of nephrolithiasis. *Advances in chronic kidney disease*. 2015;22(4):273-278.
4. Golzari SE, Soleimanpour H, Rahmani F, Zamani Mehr N, Safari S, Heshmat Y, Ebrahimi Bakhtavar H. Therapeutic approaches for renal colic in the emergency department: a review article. *Anesthesiology and pain medicine* 2014;4(1):e16222
5. García-Perdomo HA, Echeverría-García F, López H, Fernández N, Manzano-Núñez R. Pharmacologic interventions to treat renal colic pain in acute stone episodes: Systematic review and meta-analysis. *Progres en urologie : journal de l'Association française d'urologie et de la Société française d'urologie* 2017;27(12):654-65.
6. Bensalah K, Tuncel A, Gupta A, et al. Determinants of quality of life for patients with kidney stones. *J Urol* 2008;179(6):2238-43
7. Bryant M, Angell J, Tu H, et al. Health related quality of life for stone formers. *J Urol* 2012;188(2):436-40.
8. Forsythe RO, Eylert MF. Medical students and foundation doctors need more exposure to basic urology. *The Bulletin of the Royal College of Surgeons of England*. 2014 Jul;96(7):240-3.
9. Patel P, Nayak JG, McGregor TB. The value of a core clinical rotation in urology for medical students. *Canadian Urological Association Journal*. 2015 Nov;9(11-12):392.

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