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Anesthesiologists' Approach to the Treatment of Catheter Related Bladder Discomfort: A Survey Study

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Anesteziyologların İdrar Sondasına Bağlı Mesane Rahatsızlığının Tedavisine Yaklaşımı: Bir Anket Çalışması

ABSTRACT

Objective: *Urinary catheterization causes catheter related bladder discomfort (CRBD) in the early postoperative period following all surgeries. CRBD mostly develops after urological interventions and has two independent predictors: Male gender and urinary catheters ≥18F. We aimed to investigate the awareness of Anesthesiology and Reanimation specialists to CRBD and its treatment.*
Methods: *After ethics committee approval, a questionnaire with informed consent of 20 multiple-choice and open-ended questions was transferred to docs.google.com. and Turkish Society of Anesthesiology and Reanimation Specialists were contacted for contribution.*
Results: *144 anesthesiologists, 26-66 years old (39.5±8.02 years), 54.5% males, 45.5% females, 66.4% with a teaching position and 55.5% with >10 years of experience participated. 54.4% reported encountering >1 CRBD per week and mostly following urology (70.9%), obstetrics and gynecology (52.5%) and general surgery (51.1%) cases. The frequency and severity (66% and 69.5%) of CRBD was reported higher in male patients. 94.4% agreed that CRBD should be treated. 37.8% believed the surgeon should manage CRBD, 60.1% believed it should be planned together. All male participants stated treatment was necessary (p=0.008). Participants chose preemptive (19.9%, n=28), symptomatic (80.1%, n=113) or both (4.3%, n=6) treatments. The choices for preemptive and symptomatic treatment were similar; non-steroidal anti-inflammatory drugs (70.8%, 59%), paracetamol (43.4%, 50.7%) and tramadol (18.9%, 21.6%). Participants' knowledge on factors effecting CRBD was lacking.*
Conclusion: *Anesthesiologists do not utilize preemptive and effective treatment for CRBD; one thirds of them do not consider it their responsibility. Anesthesiologists should be aware of CRBD and participate in the treatment using multimodal approaches.*

Keywords: *Anesthesia, urinary catheterization, urinary bladder, pain, perioperative care, survey*

ÖZ

Amaç: *Üriner kateterizasyon, tüm ameliyatları takiben erken postoperatif dönemde idrar sondasına bağlı mesane rahatsızlığına (İSBMR) neden olur. İSBMR çoğunlukla ürolojik girişimlerden sonra gelişir ve iki bağımsız prediktöre sahiptir: Erkek cinsiyet ve 18F üriner kateter. Bu çalışmada Anesteziyoloji ve Reanimasyon uzmanlarının İSBMR ve tedavisi konusundaki farkındalıklarını araştırmayı amaçladık.*
Yöntem: *Etik kurul onayından sonra, 20 çoktan seçmeli ve açık uçlu sorudan oluşan bilgilendirilmiş onam içeren bir anket docs.google.com'a aktarıldı. Türk Anesteziyoloji ve Reanimasyon Derneği ile katkıları için iletişime geçildi.*
Bulgular: *Çalışmaya 26-66 yaşlarındaki (39.5±8.02 yaş), %54.5 erkek, %45.5 kadın, %66.4 eğitim kadrosunda ve %55.5> 10 yıl deneyimli 144 anestezist katılmıştır. Katılımcıların %54.4'ü haftada 1'den fazla İSBMR ile karşılaştığını ve bunların çoğunlukla üroloji (%70.9), obstetrik ve jinekoloji (%52.5) ve genel cerrahi (%51.1) vakalarını takip ettiğini belirtti. Erkek hastalarda İSBMR'nin sıklığı ve şiddeti (%66 ve %69.5) daha yüksek bildirildi. Anesteziyoloji ve Reanimasyon uzmanlarının %94.4'ü İSBMR'nin tedavi edilmesi gerektiğini onaylarken. %37.8'i cerrahın İSBMR'yi yönetmesi gerektiğine, %60.1'i ise cerrahla birlikte planlanması gerektiğine inanıyordu. Tüm erkek katılımcılar tedavinin gerekli olduğunu belirttiler (p=0.008). Katılımcılar tedavide önleyici (%19.9, n=28), semptomatik (%80.1, n=113) yaklaşımları veya her ikisini (%4.3, n=6) seçtiler. Tercih edilen önleyici ve semptomatik tedavi seçenekleri benzerdi; non-steroid anti-inflamatuar ilaçlar (%70.8, %59), parasetamol (%43.4, %50.7) ve tramadol (%18.9, %21.6). Katılımcıların İSBMR'yi etkileyen faktörler hakkındaki bilgileri eksikti.*
Sonuç: *Anesteziyoloji ve Reanimasyon uzmanları, İSBMR için önleyici ve etkili tedavileri kullanmamakta ve üçte biri bu rahatsızlığı kendi sorumlulukları olarak görmemektedir. Anesteziyologlar, İSBMR'nin farkında olmalı ve multimodal yaklaşımlar kullanarak tedavisine katılmalıdır.*

Anahtar kelimeler: *Anestezi, idrar kateterizasyonu, mesane, ağrı, perioperatif bakım, anket*

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INTRODUCTION

Urinary catheterization often causes urinary catheter related bladder discomfort (CRBD) in the early postoperative period following all surgeries, mainly urological surgery. CRBD which is frequent in patients with a urinary catheter in the postoperative period, mostly develops as a result of urological interventions, most commonly transurethral resection of bladder tumors [1]. The common utilization of urinary catheters within the past years has led to an increase in the incidence of CRBD (47-90%) and has been rising despite the numerous treatment alternatives that have proven to be effective [2-4].

The hallmark of CRBD is increased frequency of urination and a feeling of urgency in addition to findings of overactive bladder. Its findings resemble an overactive bladder; a feeling of discomfort in the suprapubic region, a sensation of burning, increased frequency of urination, urge incontinence and a feeling of urgency [2,5]. CRBD has two independent predictors: Male gender and size of urinary catheters ≥18F [6]. Although it can affect both males and females, the incidence and severity of CRBD is higher in males which is often attributed to the longer length and the sigmoid curvature of the male urethra [4,7].

We aimed to investigate the approach and awareness of the Anesthesiology and Reanimation specialists to CRBD and its treatment in this survey study.

MATERIAL and METHODS

The study used a questionnaire that had multiple choice and open-ended answers aimed to evaluate Turkish Anesthesiology and Reanimation specialists' approaches to the treatment of "urinary catheter related bladder discomfort". A pilot study was conducted using 19 questions to which 20 participants responded and necessary changes were made based on the feedback. Ethics committee approval was obtained (No: 02022017-9). The final version of the questionnaire consisted of 20 questions. One question was open ended, 11 questions required one answer while more than one choice could be selected for the remaining 8 questions. Four questions were about demographic data, 11 were about the awareness of CRBD and the remaining five were about its treatment. An informed consent section was added to the beginning of the questionnaire. The answers were transferred to docs.google.com (Link: https://docs.google.com/forms/d/e/1FAIpQLSeTc6EmlTBkimL_mM82Sigib62MaDPy4uW1Z8LUtvAQn-WGJVQ/viewform?c=0&w=1). Turkish Society of Anesthesiology and Reanimation Specialists were contacted for the distribution of the questionnaire. The call for participants was made online on June 16th 2017 and were sent via e-mail to participants. The questionnaire remained accessible between June 16th-August 17th, 2017 and 144 specia-lists responded.

Data was obtained using Google Forms and Spreadsheets while statistical analyses were performed using SPSS© for Windows, Version 21.0 Armonk, NY, IBM Corp. Descriptive statistics were used for average, standard deviation, percentage and frequency, independent groups t-test was used for intergroup comparisons while chi-squared test was used for the intergroup comparison of categorical variables.

RESULTS

One hundred and forty-four Anesthesiology and Reanimation specialists (54.5% males, 45.5% females) aged between 26-66 with an average of 39.5±8.02 years has participated in the study. The comparison

Table I. Demographic data

Age (mean±SD) (n=138)	39.5±8	
	%	**Year**
Gender (Female/Male) (n=143)	54.5%/45.5%	78/65
Years of Experience in the Anesthesiology and Reanimation Department (n=143)		
1- <5 years	18.9%	27
5 - <10 years	25.9%	37
10 - <15 years	27.3%	39
15 - <20 years	9.1%	13
20 - <25 years	9.4%	15
25 - <30 years	5.7%	8
>30 years	2.8%	4
Institution (n=143)		
University Hospital	32%	46
Health Ministry Training and Research Hospital	29%	41
State Hospital	17%	24
Foundation University Hospital	6%	8
Private Hospital	15%	22
Other	1%	2

SD: Standard deviation, n: Number, %: Percent

of the distribution of ages, with t-test, of the female and male participants whose median values for age were 39.5±8.71 and 39.5±7.15 yr respectively, revealed that the ages of the two sexes were similar with no statistical significance (p=0.989). The 27.8% of the specialists who participated had more than 15 years of experience while 27.1% had 10-14 and 27.7% had 5-9 years. A total of 55.5% of the participants had more than 10 years of experience (Table I). Thirty-seven percent of them were employed in a university (32.2% government universities, 5.6% foundation universities), 28.7% in education and research hospitals, 16.8% in government hospitals and 15.4% in private hospitals. The rema-ining 1.4% responded as "other". Overall, 66.4% of the participants held a teaching position (Table I).

The incidence of CRBD was reported as 55.2% in all cases with a urinary catheter and as 34.6% in cases longer than 3 hours. A higher incidence of CRBD was observed in urology (70.9%), obstetrics and gynecology (52.5%) and general surgery (51.1%) cases. 54.4% of the participants reported that they encountered at least one case of CRBD per week. The frequency and severity (66% and 69.5%, respectively) of CRBD was reported as higher in male patients. CRBD was more frequent following general anesthesia (87.9%) compared to spinal (22.9%) and epidural (7.1%) anesthesia (Table II).

Even though the ratio of participants who believed that CRBD should be treated to increase patient comfort was 94.4%, 60.1% of the Anesthesiology and Reanimation specialists believed that the treatment should be planned with the surgeon. Furthermore 37.8% believed that the surgeon alone should manage CRBD while only 2.1% believed that the anesthesiologist alone should manage the treatment. All (100%) of the male participants stated that treatment was necessary while 89.6% of the female participants shared this opinion and the difference was statistically significant (p=0.008) (Table III).

When asked about the cases where they deem a urinary catheter necessary, the participants responded as cases with a duration of more than 3 hours (86.5%), cases with a high risk of kidney injury (79.4%), cases where fluid resuscitation is carried out (73%) and cases where blood transfusion is car-

Table II. Factors effecting the frequency and severity of catheter related bladder discomfort

	%	n
The Relationship with Surgical Factors (n=138)		
The type of surgery	50%	69
The invasiveness of surgery	47.8%	66
Abnormal urine output during surgery	34.8%	48
Intraoperative trauma	58.7%	81
Other	5.1%	7
The Relationship with Surgical Branches (n=141)		
Urology	70.9%	100
Gynecology and obstetrics	52.5%	74
General surgery	51.1%	72
Plastic surgery	13.5%	19
Orthopedics	36.2%	51
Ear-Nose-Throat surgery	8.5%	12
Neurosurgery	27.7%	39
Cardiovascular surgery	18.4%	26
Ophthalmology	3.5%	5
Pediatric surgery	6.4%	9
Thoracic surgery	18.4%	26
The Relationship Between Surgical Procedure Length and Catheter Related Bladder Discomfort Frequency (n=143)		
In all cases with a urinary catheter, no matter the duration	55%	79
In cases lasting shorter than 1 hour	1.4%	2
In cases lasting 1-2 hours	4.2%	6
In cases lasting 2-3 hours	12.6%	18
In cases lasting more than 3 hours	36.4%	52
The Relationship Between Anesthesia Type and Catheter Related Bladder Discomfort (n=140)		
General anesthesia	87.8%	123
Epidural anesthesia	7.1%	10
Spinal anesthesia	22.9%	32
Sedoanalgesia	12.9%	18
Peripheric nerve block	5%	7
Relationship Between Factors About the Urinary Catheter and Catheter Related Bladder Discomfort (n=141)		
The type of urinary catheter	45.4%	64
The size of urinary catheter	69.5%	98
The duration of urinary catheter	61%	86
Lubricant used for insertion of the urinary catheter	41.8%	59
Trauma during the insertion of the urinary catheter	86.5%	122
Frequency of Catheter Related Bladder Discomfort (n=139)		
In every patient with urinary catheter	16.5%	23
Once a day	7.9%	11
2-5 times a day	17.3%	24
More than 5 times a day	3.6%	5
Once a week	20.1%	28
2-5 times a week	26.6%	37
More than 5 times a week	7.9%	11
The Relationship Between Patient Gender and Frequency of Catheter Related Bladder Discomfort (n=141)		
Male patients	66%	93
Female patients	13.5%	19
Same in both genders	20.6%	29
The Relationship Between Patient Gender and Severity of Catheter Related Bladder Discomfort (n=141)		
Male patients	69.5%	98
Female patients	12.8%	18
Same in both genders	17.7%	25

%: Percent, n: Number

ried out (63.8%) (Table II).

For the treatment of CRBD the participants chose preemptive (19.9%, n=28), symptomatic (80.1%, n=113) or both (4.3%, n=6) treatments. The most frequent agents for preemptive treatment were non-steroidal anti-inflammatory drugs (NSAID) (70.8%), paracetamol (43.4%) and tramadol (18.9%). The drug choices for symptomatic treatment were similar but with different frequencies; NSAID (59%), paracetamol (50.7%) and tramadol (21.6%). No participant used peripheral nerve blocks for the preemptive or symptomatic treatment of CRBD (Table III).

Table III. The treatment approaches of anesthesiologists for catheter related bladder discomfort

	%	n
The Ratio of Anesthesiologists Who Believe That Catheter Related Bladder Discomfort Should Be Treated (n=142)	94.4	134
Female	89.6	69
Male	100*	65
Who Should Be Responsible for The Treatment? (n=143)		
Anesthesiologist	2.1	3
Surgeon	37.8	54
Both	60.1	86
The Circumstances Where the Anesthesiologist Requests A Urinary Catheter (n=141)		
In cases lasting shorter than 1 hour	0	0
In cases lasting 1-3 hour long	6.4	9
In cases lasting longer than 3 hours	86.5	122
In cases with fluid resuscitation	73	103
In cases with blood or blood product replacement	63.8	90
In cases which have a risk of renal failure	79.4	112
Other	2.1	3
Anesthesiologists' Choice of Treatment (n=141)		
Preemptive treatment	19.9	28
Symptomatic treatment	84.4	119
The Ratio of Peripheric Nerve Block Use Among Anesthesiologists for The Treatment Of Catheter Related Bladder Discomfort (n=143)		
Preemptive	0	0
Symptomatic	0	0

The Drug Preferences of Anesthesiologists	**Preemptive %**	**(n=106) n**	**Symptomatic %**	**(n=134) n**
Non-steroidal anti-inflammatory drugs	70.8	75	59	79
Paracetamol	43.4	46	50.7	68
Scopolamine	4.7	5	14.2	19
Tramadol	18.9	20	21.6	29
Meperidine	9.4	10	17.9	24
Gabapentin	1.9	2	3	4
Ketamine	0	0	0.7	1
Opioids	14.2	15	15.7	21
Dexmedetomidine	1.9	2	4.5	6
Other	16	17	16.4	22

**p=0.008, statistically significant, Fishers Exact Test*
%: Percent, n: Number

When the participants were asked which features of the urinary catheter, they thought caused CRBD, they stated traumatic insertion during catheterization (86.5%) as the most important prognostic factor which was followed by the size of the catheter (69.5%), duration of catheterization (61%), type of catheter (45.4%) and utilization of a lubricant during catheterization (41.8%) (Table II).

The participants' answers revealed surgery related trauma (58.7%) as the most important factor associated with surgery which was followed by type of surgery (50%), invasiveness of the surgery (47.8%) and abnormal urine output (34.8%) as risk factors associated with CRBD (Table II).

DISCUSSION

Urinary catheter related bladder discomfort is defined as a feeling of urgency or a discomfort in the suprapubic region and is characterized by frequent and urgent urination [6]. 15-25% of all the hospitalized patients have a urinary catheter which is more common in patients who undergo surgery [4] and the incidence of CRBD is 47-90%. In this study 54.6% of the participants stated that they observe CRBD at least once a week while 55.2% reported CRBD in every case with a urinary catheter and 36.4% observed CRBD in surgeries that last for more than 3 hours.

The participants expressed that the frequency and severity of CRBD (66% and 69.5%, respectively) is higher in male patients. Parallel to our results, Lim et al. [7] reported more CRBD in male patients compared to female patients in the first 24 postoperative hours with no significant difference in surgical pain severity among sexes which was explained by the longer urethra in men. Similarly, Bach et al. [3] explained the increased severity and frequency of CRBD in men by the longer urethra which has a sigmoid curvature.

Even though the majority of the participants believe that CRBD should be treated in order to increase patient satisfaction, only approximately two thirds of the participating anesthesiology and reanimation

specialists believe that treatment should be planned together with the surgeon, 37.8% believe that the surgeon alone should plan the treatment and 2.1% believe that they were responsible for the treatment. Based on these results, it is safe to assume that the anesthesiologists do not want to actively participate in the treatment of this complication which is reported to be the second most common cause of discomfort after pain [3,6] and it causes agitation during recovery and postoperative delirium [8-10]. Furthermore, when left untreated CRBD can cause increased stress, postoperative agitation and pain while having a negative impact on patient satisfaction and quality of life consequently delaying recovery [11,12]. Dehiscence of the surgical wound, bleeding, hemodynamic instability and increased severity of coronary artery diseases have also been reported [1]. As such, in our opinion, the anesthesiology and reanimation specialists in our country need to have an increased awareness of the early postoperative CRBD and actively participate in its treatment in order to increase the postoperative quality of care.

Another important well-known risk factor for CRBD is the diameter of the catheter [6]. As the adult female urethra is 4 cm and the adult male urethra is 18-20 cm long, with both of them having a 6 mm diameter, a 16F catheter can be used safely due to its 5.3 mm diameter. On the other hand, >18F catheters have been shown to be an independent risk factor for CRBD [6,7]. Only 45.4% of the participants in our study reported the type of catheter was a risk factor which pointed to a low level of awareness among anesthesiology and reanimation specialists concerning the size of the urinary catheter.

Urinary catheter related bladder discomfort is most commonly observed in urological surgeries and its frequency is highest in transurethral bladder resections followed by percutaneous nephrolithotomies and non-urological surgery [1]. Other surgeries with a high incidence of CRBD are gynecologic and obstetric surgeries [7]. Parallel to the literature, the participants declared that the surgeries they observed which had a higher incidence of CRBD were urology, obstetrics and gynecology and general surgery in our study. Li et al. [13] have suggested that laparotomies and a history of urinary catheterization within 3 months could be predictors of CRBD. Lim et al. [7] stated that although pain associated with urinary catheter, obstetrics and gynecology surgery and age <50 years were risk factors while body mass index, duration of surgery and postoperative pain in the surgical field were not predictors of CRBD. On the other hand, Song et al. [2] have identified age >50, laparoscopic uterine surgery and lack of additional analgesics as independent risk factors for moderate and severe CRBD.

The participants of this study reported that the most important surgical factor contributing to CRBD was surgical trauma, followed by the type of surgery, invasiveness of surgery and abnormal urine output during surgery. Based on these results, it can be said that anesthesiologists are not fully aware of the pathophysiology of CRBD.

The pathophysiology of CRBD is similar to overactive bladder [14] which is characterized by involuntary contractions of the bladder via muscarinic receptors. The urinary catheter irritates the bladder mucosa and endothelium through muscarinic receptors, which in turn causes involuntary contraction of the bladder in CRBD [15]. Numerous studies have shown the effectiveness of anticholinergics such as tolterodine, oxybutynin [3,4], muscarinic receptor antagonists such as butyl scopolamine, solifenacin [1], glycopyrrolate [16], in addition to gabapentin, pregabalin, ketamine [17], tramadol [18], morphine, fentanyl and paracetamol in a dose dependent manner [3]. The efficacy of alpha-2 agonists such as dexmedetomidine, amicasin, peripheral nerve blocks, caudal block, dorsal penile block, lidocaine-prilocaine cream in addition to desflurane, sevoflurane and propofol have been investigated [19]. Oral gabapentin has been shown to reduce the incidence for six hours postoperatively [20] while tolterodine has been more effective in reducing the severity of CRBD [19]. Muscarinic antagonists can cause dryness in the mouth, flushing and loss of visual acuity; ketamine, gabapentin and paracetamol can cause sedation and tramadol can cause sedation, respiratory depression. Tolterodine is a suitable agent for preoperative use in CRBD due to its low side effect profile [1].

The participants chose preemptive (19.9%, n=28), symptomatic (80.1%, n=113) and both (4.3%, n=6) treatments. Nonsteroidal anti-inflammatory drugs

were most frequently chosen for both preemptive and symptomatic treatment. Peripheral nerve blocks were not chosen by any of the participants for preemptive or symptomatic treatment. Based on the treatment options and the responses of the anesthesiologists, we can assume that CRBD is not effectively treated.

The main limitation of this study is the inclusion of only anesthesiology and reanimation specialists while neglecting to survey any surgeons. Other limitations were the lack of questions about the age of patients which mostly suffered CRBD and the severity of it in patients.

In conclusion, we observed that more than one thirds of the anesthesiology and reanimation specialists do not consider CRBD as their responsibility and do not actively participate in its treatment. The participants did not utilize preemptive treatment or choose antimuscarinic agents which are proven to be effective in treatment. In light of our findings, we believe that anesthesiologists should increase their awareness, particularly in surgeries performed under neuraxial anesthesia where CRBD might be overlooked, be educated about multimodal treatment approaches and actively participate in postoperative treatment of CRBD.

Ethics Committee Approval: Ufuk University Faculty of Medicine Non-Invasive Clinical Research Evaluation Committee Ethics Committee Approval was obtained (02022017-9).
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