

Attitude and barriers towards epilepsy surgery: a survey among pediatricians and pediatric residents in Türkiye

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ABSTRACT

Objective: The aim of this study was to assess knowledge and attitude towards epilepsy surgery among pediatricians and identify the barriers to referral for epilepsy surgery in Türkiye.

Material and Methods: There were 21 statements which included the following: (A) knowledge (B) attitude and (C) barriers towards epilepsy surgery. The survey was mailed to 368 pediatricians.

Results: Among responders (n=240); 56.6% (n=136) were pediatricians and 44.4% (n=104) were pediatric residents. Three quarters (76 %) of them had experiences in neurology department and 60.1 % of them encountered ≥ 30 epilepsy patients per month. Most of participants who had no idea whether epilepsy surgery is one of the treatment options were residents (p=0.046). Almost all responders (97.5%) agreed to consult a DRE (Drug Resistant Epilepsy) patient to a pediatric neurologist for medical options. Nearly half of them (43.2%) had no idea about long-term positive cognitive effects. Whereas one-third of participants stated that it is not a safe process; more than half (57%) reported not knowing where and when to refer these patients.

Conclusion: An important finding was the apparent lack of inadequate knowledge of long-term benefits and the specificity of epilepsy surgery although most of them had previous experience in neurology department. Besides the lack of epilepsy surgery centers, lack of communication is also a problem in planning the referral of patients.

Keywords: Drug Resistant Epilepsy, Pediatrics, Survey

INTRODUCTION

Epilepsy is one of the most common chronic neurological diseases worldwide and approximately one-third of these patients have seizures that do not respond to antiseizure medication therapy (1). Neurobiological aspects of epilepsy are unique to children and therefore epilepsy surgery is also an alternative safe and effective treatment option in children (2,3). Timely intervention can reduce seizures and epileptiform discharges allowing reduction in antiseizure medication (4). Additionally, successful surgical interventions have shown significant improvements in cognitive development, behavior, and overall quality of life for affected children (5).

In our country, pediatric neurologists are primarily responsible for epilepsy patients, but pediatricians encounter with epilepsy patients more frequently due to vaccination and other health issues. In addition, since epileptic patients frequently present to pediatric

outpatient clinics and emergency departments due to seizures in daily practice, pediatricians should be aware of alternative non-drug approaches in epilepsy. As far as we know, few published papers have examined these issues among neurologists or primary care doctors in the literature, and to our current knowledge there is no study from Türkiye. The aim of this study was to collect information about the domains of attitude and barriers of Turkish pediatricians and pediatric residents regarding epilepsy surgery.

MATERIALS and METHODS

The survey was prepared through the questions/statements used in previously published similar studies (6,7). A final modification was done incorporating suggestions of the experts in this field. The statements were designed by the authors considering the expected level of knowledge required for pediatricians for timely treatment and referral of epilepsy patients. After arriving on

consensus, relevance of the statements was judged independently by 3 experts (pediatric neurologists). The distribution of statements are as follows: four of them about demographic variables, nine of them (Statement 5,6,7,8,9,10,18,19,20) were about knowledge, seven of them (Statement 11,12,13,14,15,16,17) were about attitudes and the last question was about barriers towards epilepsy surgery. Out of the 21 statements, 5 to 20 were codified as agree, disagree or no opinion. and the last statement regarding barriers in practice was open ended. To ensure that all statements were answered, the participants were not allowed to move to the next one before answering the current one.

The study was a cross-sectional, descriptive, questionnaire- based study which was conducted among pediatricians and pediatric residents from Türkiye between October 2, 2022, and November 2, 2022, with the approval of the Institutional Ethics Committee from the Turkish Ministry of Health, Ankara Bilkent City Hospital Ethics Committee-2 (E2-22-1221/02.02.2022). A total of 368 pediatricians were requested to participate in the study by sending questionnaires through e-mails and 240 responded (response rate 65%). Informed consent was obtained online by adding the informed consent form to the survey prepared via Google forms in accordance with the Helsinki guidelines.

Statistical analysis:

All data were tabulated in Microsoft Excel® format and analyzed through the statistical software IBM SPSS Statistics for Windows, version 25 (IBM Corp., Armonk, N.Y., USA). Frequency and percentage were utilized as descriptive statistics. In addition, Chi square tests were done to assess whether demographics (specialty, years in practice, number of patients with epilepsy encountered per month) influenced responders' knowledge and attitude towards epilepsy surgery. p value <0.050 was accepted as significant.

RESULTS

In total, 240 of 306 pediatricians returned the questionnaire (response rate 78%). Of the participants 56.6% (n=136) were pediatricians and 44.4% (n=104) were pediatric residents. Half of the responders (49.2%) had experience of more than five years with pediatric patients. Three quarters (76%) of them had previous experience in neurology department during pediatric residency and 60.1% of them encountered more than 30 epilepsy patients on average per month. The results are summarized in Table I.

Most of participants (59.4%) who had no idea whether epilepsy surgery is one of the treatment options were residents (p=0.046). Almost 90% of responders agreed with the definition of drug resistant epilepsy (DRE) whereas the majority of them thought that only a few DRE patients can be treated with epilepsy surgery. Moreover, when we evaluated the statement about long-term outcomes, almost half of them had no idea about the positive effects of epilepsy surgery on cognitive status. This result was similar between groups and was not associated with the duration of pediatric practice (p=0.716). Approximately 92% of pediatricians

Table I: Demographic characteristics of responders

Characteristics	Values*
Total	240
Pediatricians	136 (56.6)
Pediatric residents	104 (44.4)
Years in pediatric practice	
<2 year	45 (18.8)
2-5 year	77 (32)
≥5 year	118 (49.2)
Number of children with epilepsy attended per month	
<10	36 (15)
10-30	59 (24.9)
≥30	145 (60.1)
Previous experience in neurology department	
Yes	183 (76)
No	57 (24)

*: n(%)

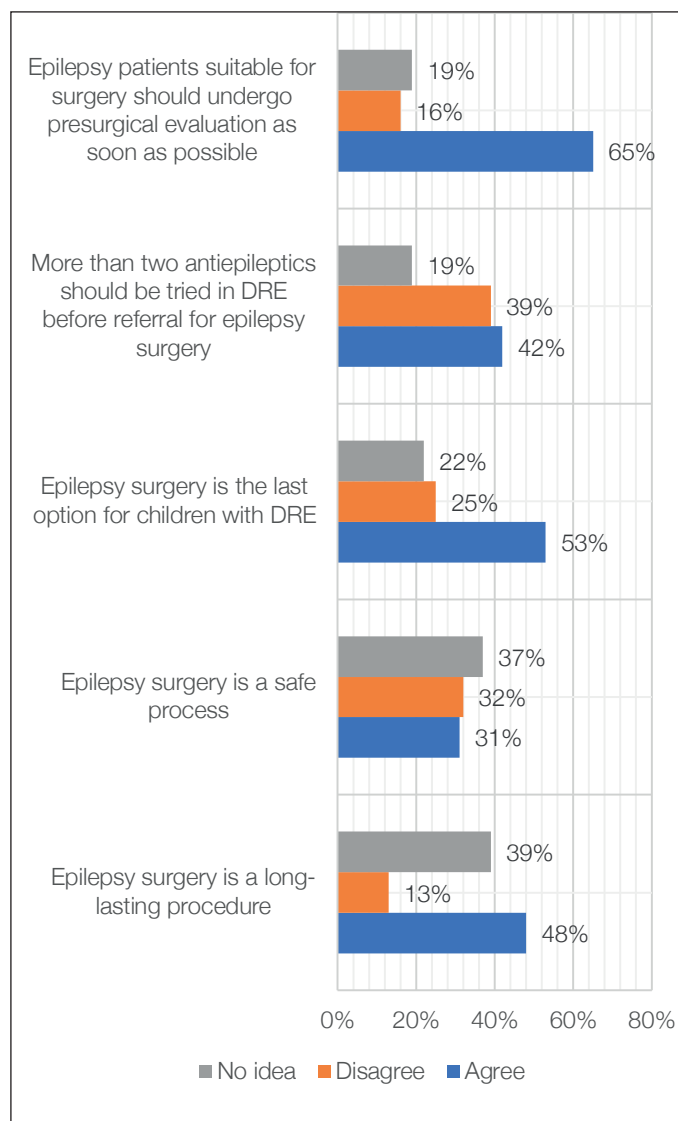
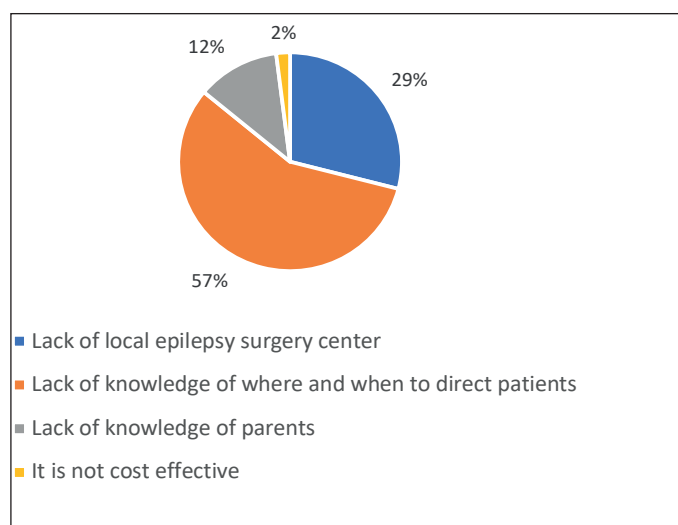
stated that DRE patients could remain seizure-free after epilepsy surgery, while this rate was 61.5% among pediatric residents (p=0.022). The participants with pediatric neurology experience (82%) were more likely to agree with this statement (p=0.005). One third of the participants (32.9%) had no idea about how to manage antiseizure medication after epilepsy surgery. Table II lists the statements and responses related to knowledge about epilepsy and epilepsy surgery.

Almost all (97.5%) responders recommended that DRE patients should be consulted to a pediatric neurologist for medical options. In response to the statement regarding the use of medications before referral for epilepsy surgery, 42% of the participants agreed to trying more than two antiseizure medications before referral for surgery. Interestingly, most of participants stated that only a few DRE patients can be treated with epilepsy surgery. There was no significant difference between pediatricians and pediatric residents in their response to this statement (p=0.058). Those with experience in pediatric neurology department agreed with the statement that DRE patients could remain seizure free after epilepsy surgery. Most pediatricians (92 %) considered that DRE patients could remain seizure free after epilepsy surgery. Pediatric residents had less information about this subject (p=0.022). Another notable finding was that half of our participants considered it was a long-lasting procedure and one-third stated that it was not a safe treatment option and there was no significant difference between pediatricians according to duration in pediatric practice. Figure 1 shows the responses related to attitude towards epilepsy surgery.

More than half of the participants (57%) had no idea where and when to refer patients with DRE. Almost 29% of the participants stated that there is no epilepsy surgery center to refer these patients, however just two percent of responders thought it was not cost-effective. There was no difference between the two groups in regards of this question (p=0.165). Statements concerning the barriers towards epilepsy surgery are summarized in Figure 2.

Table II: Statements and responses related to knowledge about epilepsy and epilepsy surgery

Statement	Pediatricians*	Pediatric residents*	p†
5. Epilepsy and seizure are synonymous			
Agree	13 (9)	9 (8.7)	0.939
Disagree	123 (91)	95 (91.3)	
No opinion	0	0	
6. Epilepsy surgery is one of the treatment options for epilepsy patients			
Agree	117 (86)	65 (62.5)	0.046
Disagree	15 (10)	22 (21.2)	
No opinion	4 (3)	17 (16.3)	
7. Failure of adequate trials of two appropriately chosen antiseizure drugs can be considered as DRE.			
Agree	122 (90.2)	89 (85.6)	0.459
Disagree	10 (6.8)	12 (11.5)	
No opinion	4 (3)	3 (2.9)	
8. A child with epilepsy can die during a seizure.			
Agree	131 (96.3)	99 (95.1)	0.432
Disagree	5 (3.6)	5 (4.8)	
No opinion	0	0	
9. Epilepsy surgery is not indicated in all children with DRE.			
Agree	127 (94)	97 (94.2)	0.951
Disagree	0	1 (0.01)	
No opinion	9 (6.0)	6 (5.8)	
10. Only few DRE patients can be treated with epilepsy surgery			
Agree	128 (97)	94 (91.3)	0.058
Disagree	4 (3)	1 (0.01)	
No opinion	4 (3)	9 (8.7)	
18. After epilepsy surgery, anti-seizure medication may be discontinued in patients.			
Agree	81 (59.5)	55 (52)	0.107
Disagree	18 (13.3)	7 (6.7)	
No opinion	37 (27.2)	42 (40.3)	
19. Epilepsy surgery is associated with improvement in long-term cognitive outcomes			
Agree	75 (55)	43 (41.3)	0.716
Disagree	10 (7.5)	12 (11.5)	
No opinion	51 (37.5)	49 (47.2)	
20. DRE patients could remain seizure free after epilepsy surgery			
Agree	125 (92)	64 (61.5)	0.022
Disagree	5 (3.6)	13 (12.5)	
No opinion	6 (4.4)	27 (26)	

*: n(%), †: Pearson Chi-square test, **DRE**: Drug resistant epilepsy**Figure 1:** Responses related to attitudes towards epilepsy surgery.**Figure 2:** Statements concerning the barriers towards epilepsy surgery.

DISCUSSION

Epilepsy surgery remains one of the least preferred evidence-based treatments, despite evidence supporting better cognitive outcomes and higher cost-effectiveness compared to medical treatment of epilepsy (8,9). Referral for epilepsy surgery was demonstrated more likely to occur through familiarity with epilepsy surgery during training or clinical practice rather than number of years in clinical practice. Additionally, uncertainties about definition of DRE, poor communication and loss of follow up after surgery, expensive preoperative examinations contributed to underutilization of epilepsy surgery in developing countries (10). While analyzing the statements, we noticed that the level of knowledge of pediatricians about epilepsy surgery was inadequate, despite the fact that most of the participants practiced in the pediatric neurology department. Pediatric residents also had insufficient information about the statement of epilepsy surgery is one of the treatment options for epilepsy patients. The majority of participants correctly identified DRE, however more than half of them stated that epilepsy surgery was the last treatment option for DRE. There was also no significant association with the duration in pediatric practice in terms of the remaining seizure-free after epilepsy surgery.

Previous epilepsy treatment studies have shown that there is a need to evaluate surgical options for ongoing dysfunctional activity in drug resistant epilepsy (11-13). Researchers have also concluded that the lack of knowledge about surgical risks and benefits may be a significant barrier towards epilepsy surgery (14). According to an international survey of epilepsy surgery centers, it was stated that one third of children were operated on within two years of epilepsy onset, despite the fact that the epilepsy surgery process started in 60% of patients as young as two years of age (15). Besides advances in structural and functional neuroimaging, neurosurgery has significantly improved surgical outcomes in children in recent years. Furthermore, it was discussed that it causes fear of surgery among pediatricians due to intraoperative complications with high mortality (16). Disagreement with the idea of the safety of procedure in one thirds of participants may be a result of these approaches in our survey. Another notable finding was that pediatric residents were less aware of whether DRE patients could remain seizure-free after epilepsy surgery. This may be due to pediatricians not following up on antiseizure medication in epilepsy patients and not have sufficient knowledge about the side effects.

Healthcare providers identify inadequate healthcare access (e.g. long waiting times, limited resources, referral delays, distance) as the biggest barrier to epilepsy surgery (17,18). Also, in a recent review, barriers including lack of clinical expertise and communication are reported (19,20). There are many pediatric neurology centers in Türkiye however there are just four (two in Ankara and two in İstanbul) epilepsy surgery centers. In addition, not all neurodiagnostic methods commonly used in adult general hospitals are available in some pediatric hospitals in our country, and therefore children are referred to adult hospitals for specialized examinations such as functional MRI, positron emission tomography, magnetoencephalography, etc. Epilepsy surgery conferences to discuss the treatment options could

increase communication between specialists and pediatricians and thus increase the number of patients referred for consideration of epilepsy surgery.

There are some limitations of the current study. Firstly, the generalizability of these results to other countries is limited as we reported on Turkish pediatricians and pediatric residents. Hence, the knowledge, attitude and practice of the pediatricians cannot be fully determined. Secondly, approximately half of participants had <5 years of experience in pediatric practice which may have influenced the level of knowledge about treatment options of epilepsy patients.

CONCLUSION

This is the first study based on the perspectives and decision-making processes of Turkish pediatricians regarding epilepsy surgery. Barriers towards epilepsy surgery can be explained by many factors, particularly knowledge gaps. Referral criterias should be established in collaboration of pediatric neurologists and epileptologists. Pediatricians need to periodically update their knowledge and strategies for timely identification for surgical evaluation.

Ethics committee approval

This study was conducted in accordance with the Helsinki Declaration Principles. The study was approved by Ankara Bilkent City Hospital Ethics Committee-2 (E2-22-1221).

Contribution of the authors

Dedeoğlu Ö: Contributed to conception and design, acquisition, data collection and analysis drafted manuscript and agrees to be accountable for all aspects of work ensuring integrity and accuracy and there is no any potential conflict of interest. **Yılmaz D:** Contributed to conception and design, acquisition and analysis, drafted manuscript and agrees to be accountable for all aspects of work ensuring integrity and accuracy and there is no any potential conflict of interest. **Arıçlı D:** Contributed to preparation manuscript, critical review manuscript and agrees to be accountable for all aspects of work ensuring integrity and accuracy and there is no any potential conflict of interest. **Gürkaş E:** Contributed to conception and design, acquisition and analysis, and agrees to be accountable for all aspects of work ensuring integrity and accuracy and there is no any potential conflict of interest. **Çıtak Kurt AN:** Contributed to conception and design, acquisition and analysis, critical review manuscript and agrees to be accountable for all aspects of work ensuring integrity and accuracy and there is no any potential conflict of interest. **Kartal A:** Contributed to conception and design, acquisition, data collection and analysis, critical review manuscript and agrees to be accountable for all aspects of work ensuring integrity and accuracy and there is no any potential conflict of interest

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Conflict of interest

The authors declare that there is no conflict of interest.

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