

AN EVALUATION OF SLEEP QUALITY USING THE SLEEP DISTURBANCE SCALE FOR CHILDREN AFTER MALE CIRCUMCISION

ERKEK SÜNNETİ SONRASI ÇOCUKLAR İÇİN UYKU BOZUKLUĞU ÖLÇEĞİ İLE UYKU KALİTESİNİN DEĞERLENDİRİLMESİ

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ABSTRACT

Aim: Circumcision is a minimal surgical procedure frequently applied in childhood. Although the procedure seems simple, there may be some adverse events perioperatively or in later periods. To the best of our knowledge, there has been no previous research evaluating the change in sleep habits that can occur in children following circumcision. The aim of this study was to evaluate children who have undergone circumcision in respect of the change in sleep habits using the Sleep Disturbance Scale.

Methods: This cross-sectional study included 345 male children who had undergone successful circumcision under general anaesthesia at the age of 7 years. For the comparison of the change in the parameters of the Sleep Disturbance Scale before and after surgery, repeated-measures analysis of variance was applied to the measurements taken at baseline and after 6 months.

Results: No significant difference was determined in the Sleep Disturbance Scale values obtained at 6 months compared to the basal values.

Conclusion: There is no significant change in the long-term sleep habits determined by the Sleep Disturbance Scale of children who have undergone circumcision.

Key words: Sleep Disturbance Scale for children, Male circumcision.

ÖZET

Amaç: Sünnet çocukluk çağında yıllardır çok sık olarak uygulanan minimal cerrahi işlemdir. İşlem kolay gibi görülse de perioperatif ve geç dönemde bazı istenmeyen olaylar olabilir. Araştırdığımız kadarı ile sünnet sonrası çocuklarda oluşabilecek olan uyku alışkanlığındaki değişiklik konusunda değerlendirme yapılmamıştır. Bu çalışmanın amacı sünnet olan çocuklarda Sleep Disturbance Scale kullanarak uyku alışkanlığındaki değişikliğin değerlendirilmesidir.

Metod: Bu cross-sectional çalışmaya 7 yaşında genel anestezi altında başarılı olarak sünnet olan 345 erkek çocuk alındı. Tüm çocuklara sünnet öncesi ve 6. ay kontrolde Uyku Bozukluğu Ölçeği yapıldı. For the comparison of the change in parameters of Sleep Disturbance Scale before and after surgery that was obtained at basal and six month, repeated-measures analysis of variance was applied.

Bulgular: Çalışmaya alınan çocukların 6. ay elde edilen Uyku Bozukluğu Ölçeği değerinin basal değerlere göre anlamlı olarak farklı olmadığını saptandı.

Sonuç: Sünnet olan çocuklarda geç dönemde Uyku Bozukluğu Ölçeği ile belirlenen uyku alışkanlığında anlamlı olarak değişiklik meydana gelmez.

Anahtar kelimeler: Çocuklar için Uyku Bozukluğu Ölçeği, Erkek sünneti.

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Bu makaleye atıf yapmak için / Cite this article: Özçelik, Z., Nacar, H., Uçak, D. (2023). An Evaluation of Sleep Quality using the Sleep Disturbance Scale for Children after male circumcision. *Gevher Nesibe Journal of Medical & Health Sciences*, 8(3), 605-609. <http://doi.org/10.5281/zenodo.8207651>

INTRODUCTION

Male circumcision (MC) is a surgical procedure which is routinely used on infants and school-age children in many countries, including Turkey. The procedure is performed with complete or partial removal of the prepuce under regional anaesthesia, sedation, or general anaesthesia (American Academy of Pediatrics Task Force on Circumcision, 2012). The selection of the anaesthesia to be applied depends on the organisation and experience of the centre, and day-case admission of the patient is usually sufficient. Although the procedure seems to be simple, as it is the first time most children have received anaesthesia, there may be associated problems, or problems related to the drugs, or the surgery itself (American Academy of Pediatrics Task Force on Circumcision, 2012).

Observations in our daily practice have shown that in addition to the short and long-term complications of circumcision in patients treated surgically for symptomatic MC, there is a deterioration in sleep quality from day one. Sleep quality in MC patients could be affected by the procedure applied, the anaesthesia, and anxiety. It can be considered that a deterioration of sleep quality in patients following circumcision could affect the development of the child. The Sleep Disturbance Scale for Children (SDSC) is a scoring system that simply evaluates the onset and maintenance of sleep, respiratory disturbance in sleep, disorders in transition from sleep to wakefulness, excessive somnolence and sleep hyperhydrosis (Brinu et al., 1996). The scale was developed for the age range of 6.5-15.3 years and can be completed in approximately 10 mins. To the best of our knowledge, there is no previous study in literature that has evaluated changes in sleep habits which could develop in children following circumcision.

The aim of this study was to evaluate changes in sleep habits using the Sleep Disturbance Scale in children who have undergone circumcision.

MATERIALS AND METHODS

Study population

Male children who underwent circumcision surgery in the Adana City Research and Education Hospital between August 2018 and April 2020 were screened for this cross-sectional study. The study inclusion criteria were defined as age 7 years and good health, with no perioperative complications associated with the anaesthesia or surgery. Patients were excluded from the study if they had a known or family history of bleeding disorder, a congenital penile problem (hypospadias, congenital chordee, or deficient shaft skin such as penoscrotal fusion or congenital buried penis), unsuccessful surgical intervention, repeated surgical interventions, an adverse event related to the anaesthesia or other medical treatment, surgery (other than circumcision) or other interventional treatment within the last year, known sleep disorder, sleep apnea syndrome, chronic obstructive pulmonary disease, bone deformity involving the chest wall, any chronic disease or medication use, psychiatric problems, damage of any organ, or no response to the items in the Sleep Disturbance Scale or not willing to participate in the study.

A total of 850 children were screened and after the application of the exclusion criteria, 345 children were included in the study. Approval for the study was granted by the Local Ethics Committee of Çukurova University Faculty of Medicine (decision no:2021/86). Informed consent was obtained from the parents or legal guardians of all the children included in the study.

After inclusion in the study, data were retrospectively collected from the hospital records of the preoperative anaesthesia evaluation, laboratory test results, the anaesthesia method used in the operation and the anaesthetic drugs used.

Sleep Disturbance Scale for Children Assessment

For evaluation of the sleep quality of the children, the parents were contacted by telephone. The Sleep Disturbance Scale for Children was completed by the parents to separately evaluate the sleep quality of the children before the operation and at 6 months postoperatively. The pre and post-operative questionnaire points were recorded on the data collection form and were compared statistically.

Anaesthesia and surgery protocol

Vascular entry was applied to the patients before admission to the operating room. Anaesthesia induction was made in the operating room with 2mg/kg propofol followed by 0.5-1µg/kg fentanyl. With the administration of dorsal penile block by the surgeon with 0.2ml/kg 0.5% bupivacaine, the operation was started. Nitrous oxide within 50% oxygen and 1 MAC sevoflurane were used in anaesthesia

maintenance. Throughout the procedure, the patient was monitored. Blood oxygenation was monitored from the finger with a saturation probe and with the application of ECG pads.

The circumcision operation was performed with the guillotine method. After suspension of the prepuce with clamps, a flat clamp was placed to remain below the glans, and the prepuce above the clamp was excised with a lancet, and by holding the mucosa the surrounding excess was cut. The penile skin and mucosa were sutured with single 5/0 sutures.

Statistical Analyses

Data obtained in the study were analyzed statistically using SPSS 23.0 software (Chicago, IL, USA). Continuous variables of in-group data were expressed as mean \pm standard deviation values. The Kappa coefficient was used to examine the interobserver variability of the Sleep Disturbance Scale for Children parameters. For the comparison of the change in the basal and 6-month values of the Sleep Disturbance Scale for Children, repeated-measures analysis of variance was applied. Statistical significance was accepted at the level of $p < 0.05$.

RESULTS

Evaluation was made of 345 children who underwent successful surgical circumcision and experienced no problems during follow up. The Sleep Disturbance Scale for Children was fully completed for all the study participants. The Cohen Kappa value evaluating interobserver variability in the Sleep Disturbance Scale for Children was 95% ($p < 0.001$). The demographic and laboratory echocardiographic findings of the study population are shown in Table 1. The changes in the Sleep Disturbance Scale for Children from before to after male circumcision are shown in Table 2.

Table 1 Demographic, laboratory and echocardiographic findings of the patients who underwent male circumcision

	Patients with male circumcision n=345
Age (years)	7 ± 0
Systolic blood pressure (mmHg)	103 ± 7.1
Diastolic blood pressure (mmHg)	67 ± 5.8
Body mass index (kg/m ²)	14.9 ± 0.86
Blood urea nitrogen (mg/dL)	24.4 ± 7.5
Creatinine (mg/dL)	0.68 ± 0.17
Sodium (mg/dL)	138 ± 3.4
Potassium (mg/dL)	4.20 ± 0.47
Aspartate aminotransferase (U/L)	23.4 ± 8.2
Alanine aminotransferase (U/L)	24.5 ± 9.8
Hemoglobin (g/dL)	13.4 ± 1.6
Hematocrit (%)	39.9 ± 4.6
White blood cell ($10^3/\mu\text{l}$)	8.4 ± 2.6

Table 2. The values obtained in the Sleep Disturbances Scale for Children before and after surgery

	Before surgery n=345	After surgery n=345	P
Sleep Disturbances Scale for Children Score	30.2 ± 4.62	30.8 ± 5.18	0.850

DISCUSSION

The main finding of this study was that the children applied with MC showed no deterioration in the sleep habits evaluated in the Sleep Disturbance Scale for Children. To the best of our knowledge, this is the first study in literature to have evaluated the sleep quality of children who have undergone MC.

MC is one of the most frequently performed surgical procedures worldwide. It may be performed as a treatment and for religious beliefs. Although MC is a surgical procedure with risks, it is performed in accordance with the wishes of parents because of the beneficial effects, which include the prevention of urinary tract infections, and reducing sexually transmitted infections, including HIV, and

the frequency of penile cancer (American Academy of Pediatrics Task Force on Circumcision, 2012). The procedure should be performed by experienced surgeons using a sterile technique and pain relief treatment. Although the rate of complications associated with the procedure is not clearly known, it has been reported to be 1-4% (Krill et al., 2011; Cathcart et al., 2006). Despite a very low rate of complication development in procedures performed by experienced surgeons, they are seen generally in 1 in 500 paediatric MC procedures. Just as in other surgical procedures, complications are classified as early and late. Early complications are in the form of bleeding and infection, whereas late complications include adhesions, skin bridge and meatal stenosis (American Academy of Pediatrics Task Force on Circumcision, 2012). MC is not recommended for children in the phallic period (3-6 years) because of effects on psychosexual functions in adolescence, but there are also studies reporting that there is no such effect (Armagan et al., 2014).

Several studies in literature have been conducted on behavioural changes following MC (Zulu et al., 2015; Kong et al., 2012; Malnory et al., 2003; Richards et al., 1976). The current study was conducted with the thought that there could be a change in sleep habits especially in the early period after MC, but there was no information available as to whether or not these effects continued in the long term. Sleep quality and duration is known to be very important for the growth and development of children, and the effect of MC on sleep quality is not clearly known. Although it is a minor procedure, for various reasons such as MC surgery may be the first surgery undergone by children, the first time they receive anaesthesia, pain experienced in the first week post-procedure and changes in habits, there may be a change in sleep habits. In addition, perioperative anxiety can also create changes in sleep in the early period after MC. This is valid not only for MC but also for other surgical procedures. Therefore, the evaluation in the current study included the late period (6 months) to eliminate the acute and early period effects of the surgery. The results of this study demonstrated that MC performed after the phallic period did not cause any long-term changes in the sleep quality of the children. As there are no other studies in literature on this subject, no comparisons could be made.

Limitations

There were some limitations to this study, primarily that there was no other study with which to compare the findings. There is only information that there could be some behavioural changes in children who have undergone MC (Zulu et al., 2015; Kong et al., 2012; Malnory et al., 2003; Richards et al., 1976). In the current study, the sleep quality evaluation was only made at baseline and after 6 months with a subjective algorithm. More significant results might have been able to be obtained if there had been evaluation of sleep habits in the short and long term rather than in a specific period. The children included in this study were 7 years old so that sleep evaluation could be made and that it was after the phallic period. The results may have been different if younger and older children had been included.

CONCLUSION

In conclusion, the study results demonstrated that there was no change in the sleep habits evaluated with the Sleep Disturbance Scale of children who underwent MC. As this study is the first in literature to have obtained data related to sleep habits after MC, there is a need for these data to be supported by further studies of other sleep evaluations including different MC groups.

Conflict of Interest

There is no conflict of interest

Financial support

There is no Financial support

Author Contributions

Plan, design: ZÖ; Material, methods and data collection: ZÖ, DU; Data analysis and comments: ZÖ, HN; Writing and corrections: ZÖ, HN, DU.

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