

The effect of preoperative fasting to postoperative agitation, nausea, and vomiting in children with tonsillectomy

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ABSTRACT

Objective: This study was conducted to investigate the effect of the preoperative fasting period on postoperative agitation, nausea and vomiting in children with tonsillectomy.

Material and Methods: Children (n:123) who have had tonsillectomy between June and December 2017 and their families have taken place in the study. The data were collected by the researchers with a questionnaire. The questionnaire consists of 29 questions in total, including Watcha Behaviour Scale and Abramowitz Emesis Score.

Results: The mean duration of preoperative fasting was 11.03±1.17 hours, the duration of thirst was 10.17±1.00 hours. The mean Behaviour scores of the children were 1.28±0.27 points, the mean vomiting score of the children was 0.01±0.07 points, 56.9% of the children in the post-operative unit were not experiencing nausea. Between duration of pre-operative fasting with agitation and vomiting status in the postoperative unit was found to statistically no relationship. According to preoperative fasting time of children, a statistically significant difference was found when children were diagnosed as having or not having symptoms of nausea.

Conclusion: It was found that the children had longer duration of preoperative fasting than the guidelines suggested in the guidelines. It was observed that pre-operative fasting time did not affect postoperative agitation and vomiting, but it affected nausea.

Practice Implications: Surgical nurses should emphasize the importance of the fasting period to families before surgery and inform families on this issue.

Keywords: Child, fasting, nausea, vomiting, nursing

INTRODUCTION

Operations are a source of stress for the child and his/her family and it affects them physically, psychologically, socially and economically (1). Nurses have important duties in the preparation of children for surgery (2). During the planning of pre, intra and postoperative care of children, the development of the child and the impacts of surgery on the child and family should be known (3).

Preoperative evaluation and preparation are highly important for safe anesthesia and a successful surgical process. The preoperative preparation of the child includes clinical history, physical preparation, necessary examinations, informing patients and their parents and psychological preparation of them (4). One of the preoperative physical preparations is preoperative fasting. The purpose of preoperative fasting is to prevent aspiration of stomach contents into the lung, especially during induction (3,4,5).

Preoperative fasting is achieved under the control of nurses in the hospital, whereas it is considered as the responsibility of families in outpatient surgery (3). In various countries, guidelines have been prepared for preoperative fasting periods. These guides recommend 2-hour preoperative fasting for clear fluids and 6-hour fasting for solid foods (6-15). However, in the studies, the preoperative fasting periods are longer than those recommended in the guidelines (3, 16-19).

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Prolonged preoperative fasting period may cause negative effects such as the feeling of hunger, discomfort, headache, dehydration, hypovolemia, and hypoglycemia (4, 17). In addition, prolonged preoperative fasting may cause a decrease in satisfaction, lead to nausea, vomiting, crying, discomfort in the postoperative period, thus to failures in the healing process and late discharge (3, 6, 16, 20). Not-Prolonged preoperative fasting allows children to feel better and experience less surgical stress (1, 2, 3).

Prolonged preoperative fasting can cause stress in children (3). This may cause Behavioural changes such as delirium and agitation in children in the postoperative care unit (21, 22). This short-term Behaviour disorder can lead to distress in the child, his/her family, and the care-giving personnel and may cause dissatisfaction with anesthesia. Additionally, because of these Behaviours, children can dislocate their cannula, dressings, and catheters (23). Moreover, swallowing difficulty, pain nausea and vomiting experienced after a tonsillectomy may make this process difficult (24). Considering all these, a good pre-operative preparation by nurses can prevent postoperative complications or control those that may occur (1, 2). This study was conducted to investigate the effect of preoperative fasting period on postoperative agitation, nausea and vomiting in children with tonsillectomy.

MATERIAL and METHODS

This descriptive and cross-sectional study was conducted in the recovery unit of the Otorhinolaryngology Department Operating Room in a University Hospital between June-December 2017. The universe of the study consisted of children aged 4-13 years who were in the recovery unit between June and December 2017 and who underwent tonsillectomy (n: 567) and the sample of the study consisted of children aged 4-13 years who were in the recovery unit between June and December 2017, who underwent tonsillectomy, who volunteered to participate in the research, and who were able to communicate and their families (n: 123).

The data were collected from the children, their mothers in face to face interviews, and patient files using the data collection form created by the researchers. This form was prepared by the researchers reviewing the relevant literature in order to determine the sociodemographic and clinical characteristics of children. The form consists of 29 questions in total, including four questions regarding sociodemographic characteristics of children, ten questions regarding preoperative conditions, five questions regarding intraoperative conditions, and ten questions regarding postoperative conditions. The children were asked to evaluate their feelings of hunger and thirst between 0 and 10 points. Their agitation status was assessed using the Watcha Behaviour Scale (25, 26) and the emesis status was evaluated using the Abramowitz Emesis Scoring Scale (27). The Watcha Behaviour Scale is a four-point scale. According to the scale, 1 point is interpreted as calm, 2 points as crying but can be consoled, 3 points as crying, not consoled, 4 points as agitated and thrashing around (25, 26). The Abramowitz Emesis Score, created by M.D. Abramowitz et al., is a scoring system for nausea and vomiting used in postoperative recovery units for both adults and children. The scoring

according to the Abramowitz Emesis Score is as follows; score 0: no vomiting; Score 1: mild vomiting, once per observation period; Score 2: moderate vomiting, two or three times per observation period; Score 3: severe vomiting, four or more per observation period; Score 4: persistent vomiting regardless of treatment (27).

The data of the research were evaluated using the Statistical Package for Social Science (SPSS) 18 package program. In the evaluation, number, percentage distributions, mean, minimum, maximum, standard deviation, Mann Whitney U tests and Spearman Correlation tests were used. The normal distribution of the data was analysed using the Kolmogorov Smirnov test. The data were evaluated at a 95% confidence interval. Statistical significance was accepted to be 0.05.

After obtaining permission from the Scientific Research and Publication Ethics Committee of a University (date: 20 April 2017 protocol number: 118-2017) in order to carry out the study, written permission was obtained from the institution where the research was conducted. The consent of the children and their mothers was taken using informed consent forms.

RESULTS

The socio-demographic characteristics of the children included in the study are given in **Table 1**. The mean age of the children was 9.76 ± 1.74 years (min:6.0-max:13.0).

Table 1: Distribution of Children according to their socio-demographic characteristics

	Number	Percentage
Age		
6 years old	4	3.3
7 years old	12	9.7
8 years old	14	11.4
9 years old	17	13.8
10 years old	35	28.5
11 years old	19	15.4
12 years old	7	13.8
13 years old	5	4.1
Gender		
Male	56	45.5
Female	67	54.5
Education		
Kindergartens	4	3.3
Primary School	119	96.7
Area of living		
City	28	22.8
District	95	77.2
Total	123	100.0

It was found that all the children spend the night before surgery at home. It was determined that all families were informed about the nutrition of children before surgery, that the information was given by their doctors, and that no written material was provided. It was found that 8.9% of children fasted 9 hours; 23.6% fasted 10 hours; 35.8% fasted 11 hours; 21.1% fasted 12 hours; 8.9% fasted 13 hours; 0.8% fasted 14 hours; 0.8% fasted 15 hours. Children's mean preoperative fasting time was 11.03 ± 1.17 (min:9.0-max:15.0) hours. It was seen that, according to the ASA

classification, 3.3% of the children consumed particulate liquids (soup, etc.); 82.1% consumed solid foods; 14.6% consumed fatty-hard-to-digest food before surgery.

29.3% of the children were dehydrated for 9 hours; 35% were dehydrated for 10 hours; 26.0% were dehydrated for 11 hours; 8.1% were dehydrated for 12 hours; 1.6% were dehydrated for 13 hours. Children's mean preoperative dehydration time was 10.17 ± 1.00 (min:9.0-max:13.0) hours. Children's last drinks before surgery were distributed according to ASA classification. 77.2% of the children drank water and 22.8% drank milk or fruit juice.

The preoperative fasting level was scored between 0 and 10 points and it was determined that 3.3% of the children gave 6 points; 28.5% gave 7 points; 51.2% gave 8 points; 16.3% gave 9 points; 0.8% gave 10 points. Children's mean preoperative fasting level was 7.82 ± 0.76 (min:9.0- max:10.0).

The preoperative dehydration level was scored between 0 and 10 points and it was determined that 12.2% of the children gave 6 points; 35.8% gave 7 points; 38.2% gave 8 points; 11.4% gave 9 points; 2.4% gave 10 points. Children's mean preoperative dehydration level was 7.56 ± 0.93 (min:6.0- max:10.0).

Children's mean duration of surgery was 68.17 ± 12.51 (min:45.0- max:105.0) minutes. The mean duration of mothers' admission to the recovery unit was 6.95 ± 5.18 (min:0.0- max:20.0) minutes. Children's mean duration of stay in the recovery unit was 48.17 ± 6.99 (min:30.0 - max:60.0) minutes.

It was found that children's mean Watcha Behaviour scale score was 1.28 ± 0.27 (1.00-2.67), that the lowest mean was seen at the 60th minute with 1.00 points, and that the highest mean was seen at the 0th minute with 1.78 points.

It was found that children's mean Abramowitz emesis score was 0.01 ± 0.07 (0.00-0.40), that the lowest mean was seen at the 30th, 45th and 60th minute with 0.00 point, and that the highest mean was seen at the 0th minute with 0.07 points.

It was observed that, in the recovery unit, 43.1% of the children experienced nausea and 56.9% did not experience. Children's mean duration of nausea in the recovery unit was 13.30 ± 10.17 (0.00-30.00) minutes.

The children's mean duration of hospital stay was 5.25 ± 0.75 (4.00-7.00) hours.

There was no statistically significant correlation between children's preoperative fasting time and the agitation status (Watcha Behaviour Scale) in the recovery unit (rs: -0.064; p:0.481) and between preoperative fasting time and vomiting status (Abramowitz Emesis Score) (rs: -0.064; p:0.483) (Table 2).

There was no statistically significant correlation between the duration of surgery and the agitation status in the recovery unit (Watcha Behaviour Scale) (rs: 0.043; p: 0.634) and between the duration of surgery and the vomiting status in the recovery unit (rs: 0.060; p: 0.513) (Table 3).

Table 2: The correlation of Children's Preoperative Fasting Time with Agitation Status (Watcha Behaviour Scale) and Vomiting Status (Abramowitz Emesis Score) in the Recovery Unit (n: 123)

		Fasting Time (Hour)	Mean Watcha Behavior Scale Score	Mean Abromowitz Emesis Scale Score
Fasting Time (Hour)	rs	1.000	-0.064	-0.064
	p	-	0.481	0.483
Mean Watcha Behaviour Scale Score	rs	-0.064	1.000	0.372**
	p	0.481	-	0.001
Mean Abromowitz Emesis Scale Score	rs	-0.064	0.372**	1.000
	p	0.483	0.001	-

rs : Spearman Correlation Analysis, * p<0.05 ** p<0.01

Table 3: The correlation of Children's Duration of Surgery with Agitation Status (Watcha Behavior Scale) and Vomiting Status (Abramowitz Emesis Score) in the Recovery Unit (n: 123)

		Duration of Surgery (Min)	Mean Watcha Behavior Scale Score	Mean Abromowitz Emesis Scale Score
Duration of Surgery (Min)	rs	1.000	0.043	0.060
	p	-	0.634	0.513
Mean Watcha Behavior Scale Score	rs	0.043	1.000	0.372**
	p	0.634	-	0.001
Mean Abromowitz Emesis Scale Score	rs	0.060	0.372**	1.000
	p	0.513	0.001	-

rs : Spearman Correlation Analysis, * p<0.05 ** p<0.01

There was a statistically positive weak correlation between the duration of stay in the recovery unit and agitation status (Watcha Behaviour Scale) (rs: 0.269; p: 0.003) (Table 4). As a result, as the duration of stay in the recovery unit increased, the score obtained according to the Watcha Behaviour Scale and agitation increased, as well.

There was a statistically positive weak correlation between the duration of stay in the recovery unit and the vomiting status (Abramowitz Emesis Score) in the recovery unit (rs: 0.276; p: 0.002) (Table 4).

There was a statistically negative moderate correlation between the age and agitation status of children (Watcha Behaviour Scale) (rs: -0.476; p: 0.001). As a result, it was determined that as the child's age increased, the score obtained according to the Watcha Behaviour Scale decreased and the child calmed down. There was no statistically significant correlation between the age and vomiting status of children (Abramowitz Emesis Score) (rs:-0.134; p:0.140).

When the agitation status (Watcha Behaviour Scale) of the children was analysed according to sex, a statistically significant difference was found (z:-2.130, p:0.033). As a result, it was observed that girls got more agitated than boys. When the vomiting status (Abramowitz Emesis Score) of the children was analysed according to sex, there was no statistically significant difference found (z:-0.141, p: 0.888).

When the nausea status of children was analysed according to their preoperative fasting time, there was a statistically significant difference was found (z: -2.115, p: 0.034) (Table 5). The mean fasting time of the children who had nausea was 10.7 hours whereas the mean fasting time of the children who did not have nausea was 11.2 hours.

When the nausea status of children was analysed according to the duration of surgery, there was no statistically significant difference (z: -1.821, p: 0.069) (Table 5). The mean duration of surgery of the children who had nausea was 70 minutes and the mean duration of surgery of the children who did not have nausea was 66 minutes.

When the nausea status of children was analysed according to the duration of stay in the recovery room, there was a statistically significant difference found (z: -3.508, p: 0.001). It was found that the children who had nausea had a longer stay in the recovery unit whereas the children who did not have nausea had a shorter stay in the recovery unit.

There was no statistically significant correlation between the duration of mothers' admission to the recovery unit and agitation status (Watcha Behaviour Scale) (rs: -0.149; p: 0.099). There was no statistically significant correlation between the duration of mothers' admission to the recovery unit and vomiting status in the recovery unit (Abramowitz Emesis Score) (rs: 0.040; p: 0.661).

Table 4: The correlation of Children's Duration of Stay in the Recovery unit with Agitation Status (Watcha Behavior Scale) and Vomiting Status (Abramowitz Emesis Score) (n: 123)

		Duration of Stay in the Recovery Unit (Min)	Mean Watcha Behavior Scale Score	Mean Abromowitz Emesis Scale Score
Duration of Stay in the Recovery Unit (Min)	rs	1.000	0.269**	0.276**
	P	-	0.003	0.002
Mean Watcha Behavior Scale Score	rs	0.269**	1.000	0.372**
	P	0.003	-	0.001
Mean Abromowitz Emesis Scale Score	rs	0.276**	0.372**	1.000
	p	0.002	0.001	-

rs : Spearman Correlation Analysis, * p<0.05 ** p<0.01

Table 5: Comparison of Children's Nausea Status According to Preoperative Fasting Time, Duration of Surgery, Duration of Stay in the Recovery Unit (n: 123)

	Nausea	n	Mean ± SD (min-max)	z	p*
Fasting Time (Hour)	Yes	53	10.792 ± 0.15(9.00-14.00)	-2.115	0.034
	No	70	11.214 ± 0.14(9.00-15.00)		
Duration of Surgery (Min)	Yes	53	70.755 ± 1.82(45.00-90.00)	-1.821	0.069
	No	70	66.214 ± 1.38(45.00-105.00)		
Duration of Stay in the Recovery Unit (Min)	Yes	53	50.660 ± 1.08(30.00-60.00)	-3.508	0.001
	No	70	46.286 ± 0.66(30.00-60.00)		

* Mann Whitney U test, Mean: Arithmetic mean, SD: Standard deviation, Min: Minimum value, Max: Maximum value

DISCUSSION

Analysis of distribution of children according to their descriptive characteristics

Tonsillectomy is one of the most commonly applied procedures in children. The frequency of tonsillectomy varies according to geographical characteristics, medical developments, experts who decide on the intervention, and differences in sociocultural characteristics (28).

In the study, the mean age of the children was found to be 9.76 ± 1.74 (min:6.00-max:13.00). 54.5% of the children were female; 96.7% were in primary school; 77.2% lived in a district. In the study conducted by Polat et al. in 2010 with 413 children, it was found that 59% of the children were male and that the mean age of the cases was 13.3 ± 3.8 years (28). In the study conducted by Gülbetekin with 68 children aged

6-17 years who underwent a tonsillectomy, it was found that 60.2% of the children were male and that 47% were at the age of 7-11 years (29).

Analysis of distribution of children according to their preoperative information

It was seen that all of the children spent their last nights before surgery at home and that the necessary information about preoperative nutrition was given by their doctors verbally. It was determined that the children and their relatives did not receive a written document. In the study conducted by Dolgun et al. about preoperative fasting, it was observed that 97.6% of the patient relatives were informed about preoperative nutrition (3). The aim of preoperative patient training is to prevent complications and teach the necessary knowledge and skills to the patient. Preoperative training provided before the surgical intervention contributes to the patient's knowledge of what will happen at each stage of the surgical intervention, makes the patient feel better physically and spiritually and to get positive surgical results. It is recommended to use visual and written materials (2). Nurses who give care to patients the most must identify the needs of patients and their relatives, inform them, and help them cope with difficulties. In the study, it was seen that the information was given by doctors.

It was found that the mean preoperative fasting time of the children was 11.03 ± 1.17 (min:9.0- max:15.0) hours, that 82.1% consumed solid food before fasting, and that the mean dehydration time was 10.17 ± 1.00 (min:9.0-max:13.0) hours, and that 77.2% drank water before fasting. Preoperative fasting guidelines have been designed to reduce the risk of pulmonary aspiration of gastric contents by reaching into the lungs during general anesthesia. In this context, the appropriate fasting time has been determined to be 6-8 hours for solids, 4 hours for particulate fluids, 4 hours for breast milk, and 2 hours for clear fluids (7-15). In this study, it was seen that the fasting and dehydration periods were longer than those recommended in the guidelines. It was found that the mean fasting level of the children was 7.82 ± 0.76 (min:9.0-max:10.0) point and that the mean dehydration level was 7.56 ± 0.93 (min:6.0- max:10.0) point. The mean fasting and dehydration scores of the children were similar to those in the literature (3, 16). In the study conducted by Engelhardt with 1350 children in 2011, 56% of the children stated that they were starving and 27% stated that they were very thirsty. In this study, it was determined that children who underwent outpatient surgery had significant discomfort before the surgery due to excessive hunger and thirst (17). Regarding fasting, patients in our country are told to limit consuming solid food or fluids after 00:00 at night. Therefore, it is suggested that fasting and dehydration times are long and that there is a need for arrangements to ensure appropriate preoperative fasting times.

Analysis of distribution of children according to their intraoperative information

It was determined that children's mean duration of surgery was 68.17 ± 12.51 (min: 45.0- max:105.0) minutes and that the mean duration of stay in the recovery unit was 48.17 ± 6.99 (min: 30.0- max:60.0) minutes. The mean duration of mothers' admission to the recovery unit was 6.95 ± 5.18 (min: 0.0- max:20.0) minutes. Patients who have regular vital signs,

who are conscious, who have place-time-person orientation, who have adequate urine output, and who do not have nausea-vomiting, pain and abnormal flows from drains are taken to the service after the recovery unit, here the recovery process is monitored, and the patient is prepared for home care (30). Being in a foreign environment and away from the mother is among the conditions that cause anxiety and agitation (31). In this case, it is important to take mothers into the recovery unit to be with their children in the early period. In the study, it was seen that mothers were taken to the recovery unit very early.

Analysis of distribution of children according to their postoperative information

In the study, the Watcha Behaviour Scale scores of children were evaluated at 0th, 15th, 30th, 45th and 60th minutes and the mean score was found to be 1.28 ± 0.27 (1.00-2.67). According to the Watcha Behaviour Scale, 1 point refers to calm, 2 points to crying but can be consoled, 3 points to crying and cannot be consoled, 4 points to agitated and trashing around (25, 26). In the study, it was observed that the 0th-minute mean score of the children was 1.78 ± 0.59 (1.00-3.00) points and the mean score decreased at 60th minute to 1.00 ± 0.00 (1.00-1.00). Children were in a state that they were calm and crying, but they could be consoled. In the study conducted by Bajwa et al. in 2010 with 117 children below 18 years of age, the agitation of 30 children in the recovery unit was evaluated using the Watcha Behaviour Scale, and it was found that 26% of the children were agitated (25). In the study, the vomiting status of the children was evaluated at 0th, 15th, 30th, 45th and 60th minutes. The mean score was 0.07 ± 0.29 (0.00-2.00) points at 0th minute, 0.01 ± 0.12 (0.00-1.00) points at 15th minute, and 0.00 ± 0.00 (0.00-0.00) at other times. According to the Abromowitz Emesis score, 0 point indicates no vomiting and 1 point indicates mild vomiting (1 time) (27). In this case, it was seen that the mean vomiting at the 0th and 15th minutes was very low in the study and that no vomiting was seen in the recovery unit after the 15th minute. It was determined that 56.9% of children did not have nausea in the recovery unit. The mean duration of nausea was 13.30 ± 10.17 (0.00-30.00) minutes in those who had nausea. Nausea and vomiting are among the most common postoperative complications. Many factors can affect nausea and vomiting besides the surgical procedure and the operation area (30). Therefore, it is important for the nurse to evaluate the patient systematically and apply appropriate nursing interventions to prevent nausea and vomiting.

It was determined that children's mean duration of hospital stay was 5.25 ± 0.75 (4.00-7.00) hours. Outpatient surgery is more preferred for children. In outpatient surgery, children come from their homes with their families in the morning, and they return home after the surgery the same day with their families (32). With outpatient surgery, the duration of separation from the family is shortened and the risk of getting hospital infections decreases (32). Therefore, the early discharge of children is important.

Examination of the correlation between preoperative and postoperative conditions of children

In the study, there was no significant correlation found between preoperative fasting times and agitation in the recovery unit and between preoperative fasting times and

vomiting. In the survey conducted by Klemetti et al. in 2009, in which children underwent an outpatient tonsillectomy, the control group received routine information, and the study group received nutritional counselling. The mean last solid food intake times were similar, whereas the mean fluid intake time was 2.69 (2.08), 1.91/14.35 hours in the study group and 12.13 (2.45), 2.95/14.05 hours in the control group. The difference in the frequency and intensity of postoperative nausea and vomiting between the study and control groups was not statistically significant (33). In the study conducted by Jayasinghe et al. in 2018 with 404 children who will undergo bone marrow aspiration, children were divided into two groups randomly; one group fasted for more than 3 hours, and the other group fasted 3 hours. 15.8% of the children in the fasting group and 8.4% of the non-fasting group experienced vomiting in the postoperative period, and excessive hunger was determined to be a risk for vomiting after paediatric anaesthesia (34).

In the study, there was no statistically significant correlation found between the duration of surgery and agitation and vomiting status in the recovery unit. There was a statistically weak correlation found between the duration of stay in the recovery unit and agitation and vomiting status in the recovery unit. As a result, it was determined that the agitation of children increased as the duration of the stay in the recovery unit increased. It is thought that agitation may be affected by being in a foreign environment for a long time.

In this study, it was seen that agitation decreased as the age of the children increased and that girls got more agitated than boys. In the study conducted by Uğur et al. in 2018, in which the factors affecting the recovery agitation of paediatric patients between the age of 3-10 were investigated, it was stated that age significantly affected agitation. The agitation score was high in children below the age of 6 years but decreased towards the age of 10 (35).

In the study, the mean fasting time of the children who had nausea was 10.792 ± 0.15 (9.00-14.00) hours whereas the mean fasting time of the children who did not have nausea was 11.214 ± 0.14 (9.00-15.00) hours and the difference was found to be statistically significant. The mean duration of surgery was 70 minutes for the children who had nausea and 66 minutes for those who did not have nausea. It was found that the children who had nausea stayed longer in the recovery unit whereas the children who did not have nausea stayed shorter stay in the recovery unit. In the study conducted by Klemetti et al., the frequency and intensity of postoperative nausea and vomiting were not found to be statistically significant between the study group who received nutritional counselling and had a shorter fluid intake time and the control group (33). There was no significant correlation found between the duration of mothers' admission to the recovery unit and agitation and vomiting. The fact that the mothers were taken inside as soon as possible may be effective in the results.

CONCLUSIONS

It was seen that the fasting time of the children was longer than those recommended in the guidelines, that the preoperative fasting time did not affect the postoperative agitation and vomiting status and affected the nausea status. It

was determined that there was a correlation between children's age and agitation, and that sex affected agitation.

It may be recommended to increase the awareness of nurses about the fasting periods of the children and ensure them to take an active role in preoperative preparation, to use written materials to inform children and their families about preoperative preparation, to keep children as short as possible in the recovery unit after surgery, and to enrich the relevant literature by carrying out studies on agitation with different groups and larger samples.

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