

Characteristics of Children Who Ingested Corrosive Substances and Their Mothers' Attitudes Toward Child-Rearing

Koroziv Madde İçen Çocukların Özellikleri ve Annelerin Çocuk Yetiştirme Tutumları

Fatma KOCAMAN,^a
Gülçin BOZKURT,^b
Gülten YILMAZ,^a
Tülay ERKAN, MD,^a
Tufan KUTLU, MD,^a
Fügen ÇULLU ÇOKUĞRAŞ, MD^a

^aPediatric Clinic,
İstanbul University
Cerrahpaşa Faculty of Medicine,
^bİstanbul University
Bakırköy Health High School

Geliş Tarihi/Received: 08.06.2010
Kabul Tarihi/Accepted: 14.03.2011

This study was presented at the 2nd National and 1st International Mediterranean Pediatric Nursing Congress, 16-19 November 2009, Ankara, Turkey.

Yazışma Adresi/Correspondence:
Gülçin BOZKURT
İstanbul University
Bakırköy Health High School,
İstanbul,
TÜRKİYE/TURKEY
gbozkurt@istanbul.edu.tr

ABSTRACT Objective: To examine the characteristics of children who ingested corrosive substances and their mothers' attitudes toward child-rearing. **Material and Methods:** This study was conducted in the pediatric gastroenterology department of a university hospital between April 2008 and March 2009. The mothers whose children were hospitalized with the diagnosis of intoxication due to ingestion of corrosive substances formed the population group, while 71 mothers who accepted to participate in the study formed the sample group. The "Form of Questionnaire" and "Parental Attitude Research Instrument" (PARI) were used for gathering data. **Results:** Corrosive substances which caused intoxication in the study were degreasers, bleaches and lime solvents. It was seen that the ingested corrosive substances were most frequently kept in the kitchen cabinets. It was seen that the ingested corrosive substances were not in their original packages (69%). The relationship between the age of the children who ingested corrosive substances ($p > 0.05$), their gender ($p > 0.05$), education level of their mothers ($p > 0.05$) and mothers' attitudes toward child-rearing were not found statistically significant. **Conclusion:** It is important to carefully buy and store corrosives, which are used as cleaning products in the house, in order to prevent corrosive poisoning in children. Comparative studies on the child rearing attitudes of mothers whose children have experienced poisoning should be conducted.

Key Words: Child; poisoning; attitude; caustics

ÖZET Amaç: Koroziv maddeler alan çocukların özelliklerini ve annelerinin çocuk yetiştirme tutumlarını incelemek. **Gereç ve Yöntemler:** Bu çalışma Nisan 2008 ile Mart 2009 arasında bir üniversite hastanesinin pediatrik gastroenteroloji bölümünde yürütüldü. Çocukları koroziv madde alımına bağlı intoksikasyon tanısıyla yatırılan anneler çalışma grubunu oluştururken çalışmaya katılmayı kabul eden 71 anne örneklem grubunu oluşturdu. "Sorgu Formu" ve "Aile Hayatı ve Çocuk Yetiştirme Tutumu Ölçeği" (PARI) veri toplamak için kullanıldı. **Bulgular:** Çalışmada intoksikasyona neden olan koroziv maddeler yağ çözücüler, çamaşır suyu ve kireç çözücülerdi. İçilen maddenin çoğunlukla mutfak dolabında tutulduğu görüldü. İçilen maddenin kendi ambalajında (%69) olmadığı görüldü. Koroziv madde alan çocukların yaşı ($p > 0.05$), cinsiyetleri ($p > 0.05$), annelerin eğitim düzeyleri ($p > 0.05$) ve annelerin çocuk yetiştirme konusundaki tutumları arasında istatistiksel anlamlı fark bulunmadı. **Sonuçlar:** Koroziv zehirlenmelerden çocukları koruma da ev ortamında temizlik için kullanılan, korozivlerin satın alınma ve saklama şekline dikkat edilmesi önemlidir. Çocukları zehirlenen annelerin çocuk yetiştirme tutumunu tanımlamak için yapılacak karşılaştırmalı çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Çocuk; zehirlenme; tutum; korozifler

Türkiye Klinikleri J Med Sci 2011;31(6):1345-50

doi:10.5336/medsci.2010-19730

Copyright © 2011 by Türkiye Klinikleri

Intoxication due to ingestion of corrosive substances is still a widespread problem in many countries of the world.¹ In Turkey, although there are no sufficient records showing its prevalence in the country, we

know by virtue of several studies that ingestion of corrosive substances ranks the second among causes of intoxication in children, at percentages ranging between 3-28%, constituting a serious risk for morbidity and mortality in children.²⁻⁵

Since children are unable to distinguish certain hazards, they are unprotected against intoxication. Number of intoxication cases due to ingestion of corrosive substances increase due to illiteracy and lack of education and launch of many new chemical substances into the market along with industrial, technological and socio-economic developments.⁶⁻⁹

The major reasons of intoxication are accidents and negligence of the parents. Most of the parents are unaware of intoxication cases. The studies made in this field indicate that cases of intoxication mostly occur in the children of parents who are irresponsible and who have psycho-social problems, and that poverty, family problems, having multiple children, parental pressure are among factors that increase the possibility of intoxication.^{1,4,8-11}

Nurses may, by educating the families, take on important roles in preventing the cases of intoxication. If the characteristics of the children who ingest corrosive substances and their parents are known, the education can be more effective, and the number of intoxication cases would be significantly decreased.

The aim of this study was to examine the characteristics of children who ingested corrosive substances and the child-rearing attitudes of their parents.

MATERIAL AND METHODS

The study is descriptive and cross-sectional. This study was conducted in the pediatric gastroenterology department of a university hospital between April 2008 and March 2009. The mothers whose children were hospitalized with the diagnosis of intoxication due to ingestion of corrosive substances formed the population group, while the 71 mothers who accepted to participate in the study formed the sample group.

The "Form of Questionnaire" and "Parental Attitude Research Instrument-PARI" were used for

gathering data. PARI was developed by Schaefer and Bell in 1958, was adapted and translated into Turkish by Le Compte and Özer in 1978.^{12,13} It was adapted to Turkish by Kucuk et al. in 1987.¹³ It is an easy-to-use scale that is applied to parents, children and youngsters and allows self-assessment. PARI is comprised of 60 items and five subscales. The factors that form the subscale are overprotective attitudes, democratic treatment and equality, rejection by the mother of maternity role, marital discordance and authoritarian, disciplined attitudes. The ratings of PARI range between 1 and 4. The response "I strongly agree" for each question receives 4 points and the others respectively receive 3, 2 and 1 point. The responses given to items 22 and 44 are rated on the reverse order. For each dimension, total score is obtained separately. The highness of the scores of each dimension signifies that the traits involved in that dimension are high. The scale can be used both by involving all of the dimensions or by including only certain traits. In this study, all the dimensions of the scale were used.

The questionnaire was administered by the researcher via a 20-30 minute face-to-face interview, which had the advantage of ensuring that the questionnaire was fully completed.

The total points that the mothers of the children who ingested corrosive substances received under the PARI scale and the total available number of scores have been given in Table 1 (Table 1).

Mothers' "Parental Attitude Research Instrument-PARI" scores were compared to the sex and age of the child and to the educational status of mothers.

The exclusion criteria were

- The mothers with psychiatric problems,
- The mothers with chronic diseases,
- The children with psychiatric and mental problems

The study was approved by the Ethics Committee of the University Hospital (No:3051). Informed consents were obtained from the mothers who participated in the study. Written consent was taken from the mothers who participated in the study.

TABLE 1: PARI* scores of mothers of children who ingested corrosive substances.

PARI subscales	Item Number	Score that Should be Earned		Score Received
		Minimum	Maximum	$\bar{X} \pm SD^{**}$
Attitude of over-parenting	16	16	64	47.0 \pm 8.6
Democratic attitude	9	9	36	24.1 \pm 3.3
Attitude of hostility and rejection	13	13	52	32.5 \pm 7.2
Marital discordance	6	6	24	16.0 \pm 4.0
Authoritarian attitude	16	16	64	43.6 \pm 7.6

*PARI: Parental Attitude Research Instrument

** $\bar{X} \pm SD$: Mean \pm Standart Derivation

The data gathered were evaluated on computer by using the percentage, average, Student-t test and one-way ANOVA statistical methods. $p < 0.05$ values were accepted as significant.¹⁴

RESULTS

The age range of the mothers was from 21 to 50 years with a mean age of 30.3 (SD= 5.7) years. Most mothers were graduated from elementary school (70.4%). Five (7%) of the mothers had previously experienced a case of intoxication of their children, whereas 66 (93%) had no intoxication experience. Out of the children, 29 (40.8%) were girls, 42 (59.2%) were boys. The age range of the children was from 1 to 13 years, with a mean age of 4.2 (SD= 2.7) and a peak age of 2 years.

It was seen that 30 of the children (42.3%) were the first child of the family, 27 (38%) of them were the second child and 14 (19.7%) were the third child of their families. Twenty (28.2%) of the children were the single child in the family, 31 (43.6%) had two brothers/sisters and 20 (28.2%) had three 3 or more sisters/brothers.

Corrosive substances that mostly caused intoxication were found out to be degreasers in 19 cases (26.8%), bleachers in 17 cases (23.9%) and lime solvents in 15 cases (21.1%). It was found out that in 33 cases (46.5%) the corrosive substances were preserved in the kitchen cabinets, in 20 cases (28.1%) on the counter or table and in 16 cases (23.9%) in the bathroom. It was observed that 69% of the corrosive substances were not kept in their original packs.

Out of the cases of intoxication due to ingestion of corrosive substances, it was found out that 21

(29.5%) occurred during spring, 27 (38%) during summer, 16 (22.5%) during fall and seven (10%) during winter.

Fifty children (70.4%) ingested the corrosive substance at their home, 21 (29.6%) in another house or at another place. Twenty four (33.8%) of the children were brought by their parents to the hospital without any interventions at home. Out of the children, 21 (29.5%) were given yoghurt, 12 (16.9%) were forced to vomit, 8 (11.3%) were given water and five (7%) were made to wash their mouths after the intoxication.

There was no statistically significant relation between the ages of the children who ingested corrosive substances and the mean scores their mothers received from the PARI subscales (Table 2).

There was no statistically significant relation between the genders of the children who ingested corrosive substances and the mean score their mothers received from the PARI subscales (Table 3).

The relation between the mean scores of the mothers of the children who ingested corrosive substances and their level of education was not found to be significant (Table 4).

DISCUSSION

It was determined that the highest risk group for accidental corrosive substance ingestion is children who were younger than five years of age, and particularly younger than two years of age. These results have been proven by many researchers.^{7,10} We suppose that children of this age group are more exposed to these types of accidents since they try to gain autonomy, they are unable to estimate the

TABLE 2: PARI* scores of mothers according to age of children.

PARI subscales	Ages 1-3	Ages 4-6	Ages 7 -above	F***
	$\bar{X} \pm SD^{**}$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	p
Attitude of over-parenting	47.4 ± 9.1	46.6 ± 7.1	46.5 ± 9.5	0.07 0.92
Democratic attitude	24.6 ± 3.7	23.6 ± 2.49	23.1 ± 3.2	1.14 0.32
Attitude of hostility and rejection	32.4 ± 7.9	33.8 ± 7.1	31.2 ± 5.5	0.46 0.62
Marital discordance	16.0 ± 4.4	16.1 ± 4.0	16.2 ± 2.6	0.02 0.97
Authoritarian attitude	43.3 ± 7.8	44.1 ± 7.4	44.0 ± 7.5	0.09 0.91

* PARI: Parental Attitude Research Instrument ** $\bar{X} \pm SD$: Mean ± Standart Derivation *** One -Way ANOVA

TABLE 3: PARI* scores of mothers according to gender of children.

PARI subscales	Girls (n= 29)	Boys (n= 42)	t
	$\bar{X} \pm SD^{**}$	$\bar{X} \pm SD$	p
Attitude of over-parenting	46.2 ± 8.7	47.6 ± 8.6	0.02 0.52
Democratic attitude	23.4 ± 3.5	24.5 ± 3.2	0.95 0.20
Attitude of hostility and rejection	32.2 ± 7.0	32.8 ± 7.6	0.03 0.74
Marital discordance	16.0 ± 4.3	16.1 ± 3.8	0.55 0.95
Authoritarian attitude	43.2 ± 7.9	43.9 ± 7.4	0.23 0.72

* PARI: Parental Attitude Research Instrument ** $\bar{X} \pm SD$: Mean ± Standart Derivation

TABLE 4: PARI* scores of mothers according to education level.

PARI subscales	Uneducated	Primary school	Secondary school	High school	F
	$\bar{X} \pm SD^{**}$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	p
Attitude of over-parenting	50.6 ± 10.1	47.7 ± 8.4	43.6 ± 9.3	46.8 ± 9.1	0.87 0.45
Democratic attitude	25.3 ± 0.5	24.4 ± 3.4	22.6 ± 2.9	23.6 ± 4.2	1.04 0.37
Attitude of hostility and rejection	40.6 ± 8.	32.2 ± 7.1	30.2 ± 6.1	35.1 ± 8.6	1.99 0.12
Marital discordance	18.0 ± 3.0	15.9 ± 4.2	15.8 ± 3.2	16.6 ± 4.6	0.28 0.83
Authoritarian attitude	45.0 ± 3.4	44.4 ± 7.9	40.5 ± 7.0	43.5 ± 7.1	0.87 0.45

* PARI: Parental Attitude Research Instrument ** $\bar{X} \pm SD$: Mean ± Standart Derivation

outcome of their acts and their instinct to derange cabinet-like spaces.^{4,15}

It is known that in Turkish families, the parents are overprotective and the child is forced to be dependent, the child is not given the opportunity to think freely.¹⁶ Some of the researchers have scrutinised whether the parental attitudes could have a role in cases of intoxication.^{4,9,11} When the scores that the mothers of the children received from the PARI scale in our study (Table 1) were compared to the scores received by the mothers of children who were involved in traumatic accidents in the study of Kaynar and Yıldız, and mothers of children who were intoxicated by reason of corrosive substance ingestion in the study of Buke et al., similar results were observed.^{1,16}

There was no statistically significant relationship between the ages of the children who ingested corrosive substances and the mean scores their mothers received from the PARI subscales (Table 2). Kaynar and Yıldız reached similar results in their study conducted on mothers of children who had traumatic accidents.¹⁶ These results were suggest that the family lives and parental attitudes of mothers towards child-rearing did not have any influence on the intoxication of children.

Fifty-nine percent of the children in the study group were boys. Several studies have shown that intoxication cases were mostly prevalent among boys.^{4,5,9,15,17} Kayaalp et al. associated boy-dependence among intoxication cases with the freedom given to boys in the society and the parental pressure applied on the girls.⁴ It was seen that there was no statistically significant relationship between the gender of the children who ingested corrosive substances and the mean scores their mothers received from the PARI subscale (Table 3). Kaynar and Yıldız reached similar results in their study conducted on mothers of children who were involved in traumatic accidents.¹⁶ Lack of a relationship between gender and parental attitudes led to the thought that this might not be an influential factor in cases of intoxication, in contrary to Kayaalp et al's assumptions.⁴

It was found out that the most frequent corrosive substances that led to intoxication at home we-

re degreasers, bleaches and lime solvents. The results of the studies conducted by Kayaalp et al., Kutilu et al, Koç et al. and Buke et al. support our findings.^{1,4-6} We think that increase in the daily use of corrosive substances at home, failure to keep them out of the reach of children, failure to preserve them in their original packs and failure to sufficiently monitor the children increase the risks of intoxication.^{3,15}

In our study, it was found that the cases of intoxication mostly occur during spring and summer, as was suggested in many other studies conducted in Turkey and in different regions.^{2,3,15,17} It is reported that the occurrence of intoxication cases is more frequent during these seasons because there is general cleaning and painting work at houses, families move their houses, travel more during these seasons and the houses are more untidy, the cupboards, drawers are generally left open.^{3,15,17}

It was found that most of the corrosive substances (69%) were not kept in their original packs and 77.5% were colourless (lucid) liquids. Yafet-Aji et al., Kayaalp et al., Koç et al. state that the cleaning agents are accidentally ingested when they are not kept in their original packs.^{3,4,6}

Most of the corrosive substances (46.5%) were found to be kept in kitchen cupboards (under the counter). Kayaalp et al. and Buke et al. also found out that the substances were mostly kept in the kitchen.^{1,4} It has been stated that, in order to prevent the cases of intoxication, it is important to keep these agents in locked cupboards, out of the reach of children and away from refrigerators, ovens or pantry boxes and to preserve them in safe containers that may not be opened easily.^{4,9}

It is emphasised that the cases of intoxication are most frequently experienced in children of negligent and uneducated families.^{4,8-11} No statistically significant relationship was observed between the education level of the mothers of children who ingested corrosive substances and the mean scores they received from the PARI subscales (Table 4). However, the majority of the mothers (70%) in the study group were elementary school graduates and the number of mothers with a higher education le-

vel was low. It may not give accurate results to interpret the education levels of the mothers in this group.

CONCLUSION

It is important to carefully buy and store corrosives, which are used as cleaning products in the house, in order to prevent corrosive poisoning in

children. Comparative studies on the child-rearing attitudes of mothers whose children have experienced poisoning should be conducted.

Particularly, the families who are in the risk group should be educated on measures such as use of labelled cleaning products only, keeping the cleaning products appropriately and on child-rearing attitudes.

REFERENCES

1. Sarıoğlu-Buke A, Corderk N, Atesci F, Karabul M, Koltuksuz U. A different aspect of corrosive ingestion in children: socio-demographic characteristics and effect of family functioning. *Int J Pediatr Otorhinolaryngol* 2006;70(10):1791-8.
2. Öner N, İnan M, Vatanserver Ü, Turan Ç, Çeltik C, Küçükkuşurluoğlu Y, et al. [Poisoning in children living in Trakya region]. *Turkish Archives of Paediatrics* 2004;39(1):25-30.
3. Yafet-Aji D, Keskin S, İler Ö. [Review of poisoning cases followed in the pediatric emergency division of Istanbul University, Cerrahpaşa Medical Faculty, Department of Paediatrics]. *Turkish Archives of Paediatrics* 1998; 33(3):148-53.
4. Kayaalp L, Odabaşı G, Doğangün B, Çavuşoğlu P, Bolat N, Bakan M, et al. [Corrosive esophagitis in children: social and psychological aspect]. *Turkish Archives of Paediatrics* 2006;41(1):24-30.
5. Kutlu T, Çullu FA, Erkan T, Aji D, Tümay GT. [Our experience with corrosive substance ingestion in children]. *Turkish Archives of Paediatrics* 1998;33(2):92-8.
6. Koç O, Karaman A, Karaman İ, Erdoğan D, Çavuşoğlu YH, Aslan K, et al. [What should be the approach to children with ingestion of household bleach?] *Pediatric Cerrahi Dergisi* 2003;17(2):70-3.
7. Aydınoğlu H, Ayyun AD, Güngör S, Turgut M, Doğan Y. [Retrospective evaluation of 176 poisoning cases followed in Firat University Faculty of Medicine]. *Turkish Archives of Paediatrics* 2000;35(4):245-8.
8. Katrivanou A, Lekka NP, Beratis S. Psychopathology and behavioural trends of children with accidental poisoning. *J Psychosom Res* 2004;57(1):95-101.
9. Baskın D, Urgancı N, Abbasoğlu L, Alkım C, Yalçın M, Karadağ Ç, et al. A standardised protocol for the acute management of corrosive ingestion in children. *Pediatr Surg Int* 2004;20(11-12):824-8.
10. Biçer S, Sezer S, Çetindağ F, Kesikminare M, Tombulca N, Aydoğan G, et al. [Evaluation of acute intoxications in paediatric emergency clinic in 2005]. *Marmara Med J* 2007;20(1):12-20.
11. De Jong AL, Macdonald R, Ein S, Forte V, Turner A. Corrosive esophagitis in children: a 30-year review. *Int J Pediatr Otorhinolaryngol* 2001;57(3):203-11.
12. Schaefer ES, Bell RQ. Development of a parental attitude research instrument. *Child Dev* 1958;29(3):339-61.
13. Öner N. [Parental attitude research instrument-PARI]. *Türkiye'de Kullanılan Psikolojik Testler Bir Başvuru Kaynağı*. 3. Baskı. İstanbul: Boğaziçi Üniversitesi Yayınları; 1996. p.538-42.
14. Bahar Z. [Statistical methods of data analysis]. Erefe İ, editör. *Hemşirelikte Araştırma*. 3. Baskı. Ankara: Odak Ofset; 2004. p.189-250.
15. Çam H, Kıray E, Taştan Y, Çerçi Özkan H. [Review of poisoning cases followed in the paediatric emergency division of Istanbul University, Cerrahpaşa Medical Faculty, Department of Paediatrics]. *Turkish Archives of Paediatrics* 2003;38(4):233-9.
16. Kaynar ND, Yıldız S. [The correlation between childhood traumatic injuries and parental attitude]. *Hemşirelik Dergisi* 2003;13(51):15-24.
17. Yafet-Aji D, İler Ö. [Childhood poisoning in Turkey]. *Turkish Archives of Paediatrics* 1998; 33(3):154-8.