



# Knowledge, Attitudes, Behaviors of Families on Rotavirus Vaccine

## Ailelerin Rotavirüs Aşısı Hakkındaki Bilgi, Tutum, Davranışları

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### ABSTRACT

**Background:** Rotavirus is the most common and important cause of gastroenteritis in the newborn and young children worldwide. Vaccination is the main way to prevent Rotavirus infection. The aim of the present study is to determine the level of knowledge about the Rotavirus vaccine and attitudes towards the vaccination in families having children between the ages of 0 and 2 taking the socio-demographic characteristics into account. **Methods:** The study was carried out by applying a questionnaire to the parents who admitted to the Pediatrics Outpatient Clinic and Pediatric Emergency Department of Ankara Research and Training Hospital between April 2011 and April 2012. Statistical analyses were performed by using the SPSS 19 program. **Results:** A total of 1005 parents were surveyed; 857 (85.3%) participants were not aware of Rotavirus vaccination and 873 (86.9%) were not aware of Rotavirus. Among 148 participants who knew Rotavirus vaccination, only 36 had vaccination. **Conclusion:** Awareness of Rotavirus vaccine and its frequency of application were found much lower than expected. Socio-demographic characteristics of the parents and the attitudes of the physicians may be suggested to affect the frequency of vaccination. In order to increase vaccination rates, it is important for health care professionals and especially for physicians to inform the parents about Rotavirus vaccination.

**Key words:** Rotavirus vaccine, parent, knowledge level, attitude

### ÖZET

**Giriş:** Rotavirüs bütün dünyada yenidoğan bebek ve küçük çocuklarda görülen gastroenteritlerin en yaygın ve önemli sebeplerindendir. Rotavirüsün enfeksiyonuna karşı başlıca korunma yöntemi aşılamadır. Bu çalışmanın amacı 0-2 yaş çocuğu olan ailelerin sosyodemografik özellikleri de göz önünde bulundurularak, Rotavirüs aşısı hakkındaki bilgi düzeylerini ve aşının uygulanmasına karşı tutumlarını saptamaktır. **Yöntemler:** Çalışma, Nisan 2011- Nisan 2012 tarihleri arasında Ankara Eğitim ve Araştırma Hastanesi Çocuk Hastalıkları Polikliniği ve Çocuk Acil Servisi'ne müracaat eden ailelere anket uygulanarak gerçekleştirildi. İstatistiksel analizler SPSS 19 programı ile yapıldı. **Bulgular:** Toplam 1005 ebeveyne anket uygulandı. 857 (%85,3) katılımcının Rotavirüs aşısını bilmediği, 873 (%86,9) katılımcının da Rotavirüsten haberdar olmadığı saptandı. Rotavirüs aşısını bilen 148 katılımcının sadece 36'sı çocuğuna aşısı yaptırdığını belirtti. **Sonuç:** Bu çalışmada, Rotavirüs aşısının bilinirliğinin ve uygulanma sıklığının beklenenden çok düşük olduğu saptandı. Aşılamada ailelerin sosyodemografik özelliklerinin ve hekimlerin tutumlarının etkili olduğu söylenebilir. Aşılama oranlarının artırılmasında başta hekimler olmak üzere sağlık personelinin rotavirus aşılması konusunda ebeveynleri bilgilendirmesi önem taşımaktadır.

**Anahtar kelimeler:** Rotavirus aşısı, ebeveyn, bilgi düzeyi, tutum

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## INTRODUCTION

Rotavirus is one of the most common and important cause of gastroenteritis seen in newborns and young children worldwide. It is estimated to be responsible for approximately 37% of deaths under the age of 5.<sup>1</sup> In children, the clinical presentation of Rotavirus infection varies from asymptomatic infections to dehydration leading to death. Rotavirus is most commonly seen in children younger than 5 years, especially between 6 and 24 months.<sup>2</sup> Rotavirus Group A infection is the most prevalent group in the world and cause 21-65% of serious infantile gastroenteritis. For this reason, the main method of protection against rotavirus infection is vaccination. Vaccination for Rotavirus decreases mortality and hospital stay significantly.<sup>3</sup> Monovalent and pentavalent oral live attenuated vaccines against human Rotavirus have been approved in a number of countries. In a study conducted in Nigeria, it has been found that vaccination for Rotavirus is 66.7% protective against serious diarrhea.<sup>4</sup> Rotavirus vaccine prevents serious infectious disease, reduces hospitalization and economic losses, and minimizes mortality. Although Rotavirus vaccines are licensed in Europe and in many other countries, national vaccination programs have yet to be introduced, where as it has been included in the childhood immunization schedule in countries such as the US, Venezuela, Brazil, Mexico and Austria.

In our country, all healthcare workers should inform parents about Rotavirus infections and Rotavirus vaccine as Rotavirus vaccine has not yet been included in the national vaccination program and parents provide vaccines for their infants by their own means.

The aim of the present study is to determine the level of knowledge about Rotavirus, and attitudes and behaviors of parents toward, and Rotavirus vaccination in families having children aged 0-2 years.

## MATERIALS AND METHODS

A 28-item questionnaire was applied to the parents of 0-2 year old children who were admitted to Pediatrics Outpatient Clinic and Pediatric Emergency Department of Ankara Research and Training Hospital between April 2011 and April 2012. Ethical approval for the study was obtained from Ankara Research and Training Hospital Training Planning Board (13 April 2011 - 413/3458). The parents were informed about the aim of the study and a total of 1054 parents who were volunteer to participate in the survey were included in the study. Forty one parents who did not agree for participation and 8 parents who could not complete the questionnaire for various reasons were excluded from the study. The age, number of children, income level, or other criteria were not taken into account when selecting the parents to participate in the study.

A questionnaire consisting of 28 multiple-choice questions, which also defined socio-demographic characteristics, was applied by means of a face-to-face interview method. The statistical analyses were performed by using the SPSS 19.0 program. The results were evaluated at 95% confidence level and a p value of <0.05 was considered statistically significant.

The results of the descriptive statistical analyses were expressed as mean± standard deviation, and frequency. Chi-square test was used for comparisons of the data.

## RESULTS

A total of 1005 parents were surveyed. The average age of the infants was 10 months and 42.9% of the infants were between 7-12 months of age; 53.8% of the infants were boys and 46.2% were girls. The majority of the mothers were in the age range of 23-26 years (27.2%), and graduates of elementary school (35.9%). While 53% of the parents who were aware of Rotavirus were graduates of college and 7% of the parents who were not aware of Rotavirus were found to be graduates of college. These results show that the education level of the mothers' were significantly higher in the families who were aware of Rotavirus ( $p < 0.001$ ). The level of knowledge of the parents about Rotavirus vaccination according to the education level is shown in Table 1.

Of the mothers, 15.6% were working, while 84.4% were not working. In 37.5% of the families who thought that the Rotavirus vaccine should be applied, the mothers were graduates of elementary school. According to this, educational level of the mothers who think that Rotavirus vaccine should be applied was lower ( $p < 0.05$ ). Of the fathers, 31% were graduates of elementary school and 97% were working. In the families who were aware of Rotavirus, 57.6% of the fathers were graduates of college; the education level of the fathers was higher in the families who were aware of Rotavirus ( $p < 0.001$ ).

Of the families, 56.1% had income below 750 TL and 31.8% of the families who knew Rotavirus vaccine had income over 2750 TL. The income level of the families who knew Rotavirus vaccine was statistically significantly higher ( $p < 0.001$ ). Knowledge level of the families about Rotavirus vaccination according to the income level is compared in Table 2.

Of the families, 64.6% reside in apartment buildings and 62.2% of the families who think that Rotavirus vaccination should be applied were using municipal water. According to this, the percentage of the families who use municipal water was higher in the group who think that the Rotavirus vaccine should be applied.

In the families participating in the survey, 76.7% of the infants were continuing breastfeeding and 61.1% of the infants who continued breastfeeding and 24.8% of the

babies who discontinued breastfeeding had no diarrhea at all ( $p < 0.001$ ).

<b>Table 1. The knowledge level of the mothers about Rotavirus vaccination according to the education level</b>			$p : p < 0.001^{**}$	
			Awareness of Rotavirus vaccine	
			Yes	No
<b>Mothers' education level</b>	<b>Illiterate</b>	<b>n (%)</b>	1 (2)	45 (98)
	<b>Elementary school</b>	<b>n (%)</b>	15 (4)	346 (96)
	<b>Intermediate school</b>	<b>n (%)</b>	20 (10)	187 (96)
	<b>High school</b>	<b>n (%)</b>	37 (14)	223 (86)
	<b>College</b>	<b>n (%)</b>	75 (57)	56 (43)
<b>Total</b>		<b>n (%)</b>	148 (15)	857 (85)

<b>Table 2. The knowledge level of parents about Rotavirus vaccination according to the income levels of the families</b>			$p : p < 0.001^{**}$	
			Awareness of Rotavirus vaccine	
			Yes	No
<b>Income level</b>	<b>Less than 750 TL</b>	<b>n (%)</b>	38 (25.7)	526 (61.4)
	<b>Between 750-2750 TL</b>	<b>n (%)</b>	63 (42.6)	310 (36.2)
	<b>Above 2750 TL</b>	<b>n (%)</b>	47 (31.8)	21 (2.5)
<b>Total</b>		<b>n (%)</b>	148 (100)	857 (100)

TL: Turkish Lira

<b>Table 3. Awareness of Rotavirus vaccine according to the number of diarrhea the babies had</b>			$p = 0.001^{**}$	
			Awareness of Rotavirus vaccine	
			Yes	No
<b>Number of diarrhea</b>	<b>0</b>	<b>n (%)</b>	100 (67.6)	429 (50.1)
	<b>1-2</b>	<b>n (%)</b>	27 (18.29)	267 (31.2)
	<b>3-4</b>	<b>n (%)</b>	11 (7.4)	87 (10.2)
	<b>&gt;4</b>	<b>n (%)</b>	10 (6.8)	74 (8.6)

<b>Total</b>	<b>n (%)</b>	148 (100)	857 (100)
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Of the babies, 98.6% were born in the hospital and 58.3% of the mothers received maternal education in the health institution. There was no correlation between maternal education and knowledge about Rotavirus ( $p > 0.05$ ).

We found that 85.3% of the families were aware of Rotavirus vaccination and 73.6% of these families thought that the babies had to be vaccinated. We also found that 57.4% of the families who knew about Rotavirus vaccine were informed by doctors, 17.6% by healthcare workers such as midwives and nurses, 1.4% by pharmacists, 7.4% by friends and relatives, 2% by teachers, and 14.2% by newspapers, TV and internet.

Whereas 65.5% of the families thought that the Rotavirus vaccination should be applied, only 3.6% of the babies were vaccinated. In the comparison regarding frequency of diarrhea, the babies of the families who were aware of Rotavirus vaccination had statistically less diarrhea. (Table 3)

## DISCUSSION

Rotavirus is responsible for 20-50% of diarrhea in children under 5 years of age in our country.<sup>5</sup> In order to prevent Rotavirus-related mortality and morbidity, many countries have evaluated Rotavirus vaccination programs, pharmaco-economic analyzes, and have been considering routine vaccination as a cost-effective method to reduce the burden on the country's economy.<sup>6</sup>

Roman et al., in their study on children between 0-4 years of age, reported that diarrhea was seen most frequently in the age group of 7-18 months.<sup>7</sup> Holman et al., in their study lasted 16 years, reported that children who have been hospitalized for diarrhea were most frequently at 1-11 months of age.<sup>8</sup> Similarly, we found that, the average age the babies who have diarrhea was 10 months.

In the study of Roman et al., 52% of the babies were boys and 48% were girls.<sup>7</sup> Likewise, in the study of Kılıç et al., gender distribution was balanced.<sup>9</sup> Similar to both studies, in our study 46.2% of the babies were girls and 53.8% were boys.

In a study conducted in Italy, education level of the mother was found to be the primary factor in awareness of vaccines.<sup>10</sup> Similarly, we found that education level of the mothers who knew about Rotavirus and Rotavirus vaccination was higher than those who weren't aware of Rotavirus and Rotavirus vaccination.

In our study, the ratio of working mothers was significantly higher than the housewives regarding awareness of Rotavirus vaccination. This observation suggests that mothers' involvement in economic life and economic contribution enhance

their accessibility to both information and healthcare services.

Salazar-Lindo et al., in their study investigating the relationship between environmental enteropathogens and intestinal infections, reported that, anatomic structure of the intestines is disturbed due to malnutrition in the regions with low socioeconomic levels and consequently the risk of diarrhea is increased.<sup>11</sup> Suggesting a similar relationship, awareness of Rotavirus vaccination was found significantly higher in the families with higher income in the present study.

In children, several microorganisms, reaching the gastrointestinal tract through infected food, beverages and various kinds of materials in the environment, cause diarrhea.<sup>12</sup> Therefore, in order to prevent diarrhea caused by Rotavirus, it is necessary to provide clean drinking water, proper environmental conditions, proper disposal of solid wastes, and educate families about hygiene. Water-borne diarrhea outbreaks frequently occur in settlements where substructure is inadequate.<sup>13</sup> In our study, 64% of the families have been living in apartment buildings and 62.2% of them have been using municipal water. These ratios explain the better hygiene conditions are and less frequency of enteritis cases.

Carneiro et al. found that breastmilk was protective against severe Rotavirus gastroenteritis and reduced hospitalization rates.<sup>14</sup> Yalcin et al., in their study investigating risk factors for hospitalization in children between 0-24 months, reported that breastfeeding was protective.<sup>15</sup> On the contrary to this study, it has been suggested that breastfeeding may decrease the effectiveness of vaccination especially at the second season encounter in another study.<sup>16</sup> Dennehy et al., found that below 25 years of maternal age was a risk factor that increased hospitalization rates in their study conducted in the United States.<sup>17</sup> Newman et al., found that below 20 years of maternal age was a risk factor for Rotavirus-related hospitalization in babies during the first 12 months.<sup>18</sup> In our study, 76.7% of the babies were fed with breastmilk and the hospitalization rate due to enteritis was found to be 3.5%. This low ratio of hospitalization was suggested to result from the high proportion of infants receiving breast-milk and the average age of the mothers was 27.02 years.

In the study of Rahman et al., the mothers' lack of information about diseases that can be protected by vaccination was found to be associated with delayed or missed vaccinations.<sup>19</sup> For this reason, at first, the mothers should be informed about the diseases and the prevention, then the vaccination should be suggested. Bond and Nolan in their qualitative study on mother's thoughts about vaccines, found that the lack of detailed knowledge

of mothers constitutes a barrier against vaccination.<sup>20</sup> During training on vaccination, providing detailed information about the contents and all positive and negative effects of the vaccines can help mothers to be more committed to vaccination. In a thesis study conducted at Bakirkoy Dr. Sadi Konuk Research and Training Hospital, it has been concluded that if healthcare workers were able to communicate adequately with the mothers and to allocate sufficient time to maternal education, more than half of the mothers would be willing to apply the vaccines that weren't covered by the insurance system.<sup>21</sup> In our study, we found that only half of the mothers had received maternal education, which may explain the lack of information on rotavirus.

Basbakkal suggested that, physicians and nurses are the best source of information about rotavirus due to their close position to the community.<sup>22</sup> In the survey of Evan Simpson et al., including 546 subjects in India, Indonesia, Nicaragua, Thailand and Ukraine, it was found that awareness of Rotavirus was extremely low.<sup>23</sup> In our study, the awareness of Rotavirus and Rotavirus vaccine was similarly low. In the study of Bond and Nolan, one of the most important obstacles to mother's decision of vaccination was poor communication with the healthcare personnel.<sup>20</sup> Eliminating these obstacles can be achieved by organizing trainings both for mothers and healthcare personnel, targeting to eliminate incorrect information and beliefs and to increase communication between healthcare personnel and mothers.<sup>21</sup> Lannonet al., in their focused group study, emphasized that the timing is as important as the quality of the training.<sup>22</sup> The mothers participating in the study stated that they thought that information about vaccinations will be useful when such training is given during prenatal care and hospitalization for delivery. Using a method appropriate to the education levels of the mothers is important for achievement of the training; this should be taken into consideration when training material is being organized.<sup>22</sup>

Motivating employees, organizing activities reminding their functions, and ensuring health professionals to participate in the decision-making processes may be recommended to increase vaccination rates. Regarding the factors affecting the vaccination rates, Uzuner et al., suggested maternal education and income level, social assurance, pregnancy follow-up and maternal tetanus vaccination status; Akturk et al., suggested maternal education and monthly average income level; and Aycicek suggested maternal education level, settlement place (rural or urban), socioeconomic environment and economic status of the family.<sup>23,24</sup> In our study, economic status and educational status of the families who applied vaccinations were found to be higher.

## CONCLUSION

The awareness of Rotavirus vaccine and the frequency of vaccination were found very low in the present study. In addition, a significant positive relation was found between the education and income levels and the awareness of Rotavirus vaccination. Therefore, we suggest that, the primary care physicians, nurses and midwives have the best opportunity to inform the mothers about child's development, care and immunization, through an effective approach, due to their close communication with mothers and active involvement in the planning and execution of vaccination in government institutions. They can achieve this effectively by inviting the children for routine follow-ups in primary care settings and home visits.

## Conflict of Interest

No conflicting interests exist for any authors. No financial support was given. No other relationships/conditions/circumstances are present.

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