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Original Article

Obstetrician–Gynecologists' Knowledge and Awareness on Nasoalveolar Molding in Newborns with Cleft Lip and Palate

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Main Points

- Obstetrician–gynecologists (OB-GYNs) play an important role on the diagnosis of orofacial clefts with the help of prenatal ultrasound image scanning. However; despite their crucial contribution on diagnosis, their knowdge on nasoalveolar molding is insufficient.
- Nasoalveolar molding (NAM) provides aesthetic and functional anatomy, approximation of the maxillary segments and psychological support to the parents of the newborns with cleft lip and palate (CLP).
- Informative seminars and conferences should be organized to increase the awareness of Obstetrician–gynaecologists regarding NAM and multidisciplinary treatment approaches of newborn CLP patients.

ABSTRACT

Objective: This study aimed to determine the level of knowledge and awareness of obstetrician–gynecologists (OB-GYNs) about the presurgical orthopedic treatment of newborns with cleft lip and palate (CLP).

Methods: We conducted a 12-question survey by email to 532 OB-GYNs who were members of the Turkish Obstetricians and Gynaecologists Association. The participants were asked about their years in practice, region of practice, and knowledge of CLP and nasoalveolar molding (NAM).

Results: A total of 141 OB-GYNs agreed to participate and completed the survey. Fifty-nine (42%) of 141 OB-GYNs had never heard of NAM treatment in newborns with CLP. Twenty-seven percent had information about NAM, and 23% referred newborns with CLP for NAM. No statistically significant difference existed in the knowledge level about the preoperative treatment of newborns with CLP between experienced and inexperienced OB-GYNs ($P > .05$).

Conclusion: The knowledge levels of OB-GYNs about NAM were insufficient. We hope that this study will provide more effective results in OB-GYNs referring newborns with CLP for NAM.

Keywords: Cleft lip and palate, survey, nasoalveolar molding, obstetricians, gynecologists

INTRODUCTION

Cleft lip and palate (CLP) is the second most common congenital defect, according to the Centers for Disease Control and Prevention.[1] The frequency of various cleft lip types with or without cleft palate is 1 in 700-1000 live births worldwide.[2,3] A multidisciplinary team of experts evaluates newborns with CLP and provides a surgical treatment that is usually performed in the first year. However, the number of surgical operations these individuals undergo can vary from 2 to 20 until adulthood.[4]

Nasoalveolar molding (NAM) has emerged as a relatively new technique in cleft care over the past decade. The NAM technique uses acrylic nasal protrusions that are attached to the vestibular part of the acrylic

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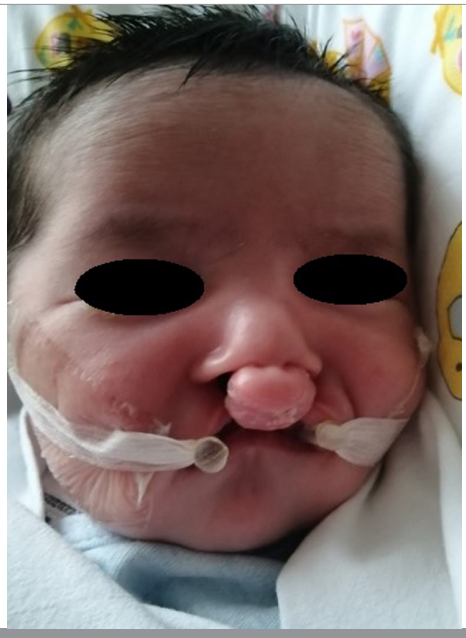

Figure 1. Bilateral cleft lip and palate patient facial photograph

feeding plate to bring the nasal alar cartilage to the normal form and position in the neonatal period. Moreover, NAM contributes to the elongation of the columella before cleft lip surgery. The NAM technique facilitates the surgical reconstruction of the cleft and reduces the severity of the deformity (Figures 1-3).

Newborns with CLP start using the NAM appliance immediately after birth and before surgical treatment of the lip at around 5 months of age or when the cleft is reduced to less than 5 mm between segments. The parents perform daily adjustments to the bands on the infant's face and attend weekly or biweekly clinical appointments. Both short- and long-term studies have shown that NAM significantly improves nasal symmetry compared to surgical treatment alone. Additionally, NAM provides

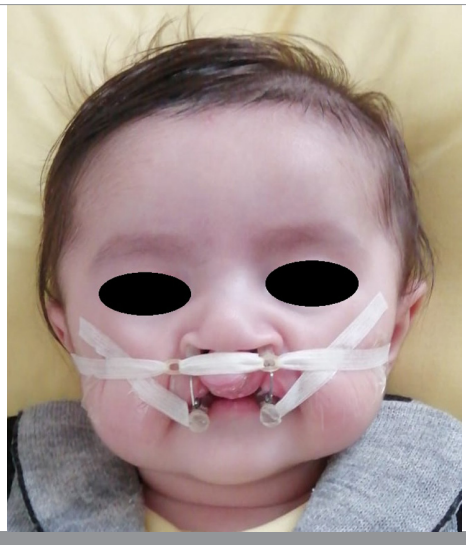

Figure 2. Nasoalveolar molding appliance in situ

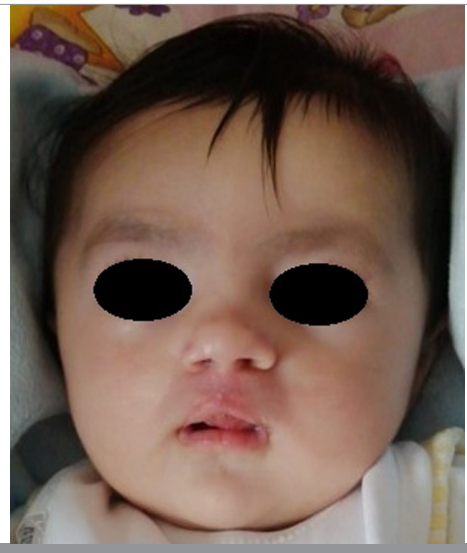

Figure 3. Extraoral view of repaired cleft lip and palate(CLP), after NAM therapy

aesthetic and functional anatomy and approximation of the maxillary segments.[5-8]

Obstetrician–gynecologists (OB-GYNs) are often the first to discover orofacial clefts and other craniofacial conditions in prenatal ultrasound image scanning. Prenatal ultrasound is also generally the first picture of the infant for parents, who do not expect the sonographer to detect a birth defect.[9] The sensitivity of the routine transabdominal ultrasound scan at 20 gestational weeks ranges from 16% to 93%.[10,11] However, when a fetus is diagnosed with CLP by ultrasonography, the treatment options should be planned in a multidisciplinary way. Obstetrician–gynaecologists play an important role in the diagnosis of CLP in terms of educating the parents about the treatment progress and interdisciplinary team approach, timely referral to an orthodontist, and early commencement of psychological support for the parents.

This study aimed to determine the level of knowledge and awareness of OB-GYNs about the presurgical orthopedic treatment of newborns with CLP.

METHODS

We conducted a questionnaire study with OB-GYNs who were randomly selected from all over Turkey. The study was approved by the Clinical Research Ethics Committee of Ordu University (No. 2020/220). The questionnaire was specifically designed by the researchers using a Google Forms platform. Responses from OB-GYNs that were received within 12 weeks were included. The purpose of the project was communicated to all the participants. The questionnaire was distributed by email to 532 OB-GYNs, of whom 141 agreed to participate. The questionnaire consisted of 12 questions in 2 parts (Table 1). First, demographic information was collected, including title, workplace, and years of practice. The participants were asked about their knowledge of CLP and

Table 1. Questionnaire

Questions	Answer
What is your title?	Specialist Doctor
	Assistant Professor
	Associate Professor
	Professor
What is your gender?	Male
	Female
How many years have you been an OB-GYN?	
What is your workplace?	Faculty of Medicine
	Public Hospital
	Private Practice/Hospital
Do you have any information about orthopedic applications performed before surgical treatment of CLP newborns?	Yes
	No
How many CLP newborn births have you ever seen?	None
	1-4
	5-10
	> 10
Have you heard about feeding plate/ NAM in CLP newborns?	Yes
	No
Do you know what NAM is?	Yes
	No
Do you know who performed the NAM?	Yes
	No
Do you know for what purpose NAM is performed?	Yes
	No
Do you refer patients for NAM application?	Yes
	No
When you diagnose CLP on ultrasound, which unit do you refer the patient to?	Plastic and Reconstructive Surgery
	Pediatrics
	Dentist
	Orthodontics
	I do not refer

CLP, cleft lip and palate; NAM, nasoalveolar molding.

NAM in the second part. Of the total participants, 78 (55%) were female and 63 (45%) were male. Those who had been OB-GYNs for 10 years or more were described as experienced, while those practicing for less than 10 years were described as inexperienced. Eighty-six (61%) of the participants were inexperienced, and 55 (39%) were experienced.

Statistical analysis used SPSS software (SPSS for Windows version 20.0; SPSS Inc, Chicago, IL, USA). Descriptive statistics were formed for the evaluated parameters. Percentages were calculated for categorical variables. The Pearson chi-square test was used to compare OB-GYNs according to their level of knowledge of preoperative treatment of newborns with CLP. Statistical significance was set at $P < .05$.

Table 2. Sociodemographic characteristics of OB-GYNs (N = 141)

Gender	n	%
Female	78	55
Male	63	45
Experience		
Less than 10 years	86	61
10 years or more	55	39
Workplace		
Faculty of Medicine	64	45
Public Hospital	43	31
Private Practice	34	24

%, Percentage; Sample (N) = 141.

RESULTS

A total of 141 OB-GYNs responded to the questionnaire. Sixty-four (45%) worked in a Faculty of Medicine, 43 (31%) in public hospitals, and 34 (24%) in private healthcare (Table 2). Sixty-four (45%) participants had knowledge of the orthopedic practices performed before the surgical treatment of newborns with CLP. Thirty-three (23%) OB-GYNs referred newborns with CLP for NAM, and 108 (77%) did not (Table 3).

While 11 (8%) OB-GYNs had never attended the birth of a newborn with CLP, 93 (66%) had attended 1-4, 22 (16%) had attended 5-10, and 15 (11%) had attended more than 10 (Table 4).

Fifty-nine of 141 (42%) OB-GYNs have never heard of NAM treatment for newborns with CLP. Thirty-eight (27%) had information about NAM, whereas 103 (73%) OB-GYNs did not know the purpose of NAM.

No statistically significant difference existed in the knowledge level of preoperative treatment of newborns with CLP between experienced and inexperienced OB-GYNs ($P > .05$; Table 4).

DISCUSSION

Orofacial clefts are among the most common congenital craniofacial abnormalities. The etiology of CLP is multifactorial, and the incidence may be affected by many factors, including

Table 3. Percentage distributions of the OB-GYN where to refer newborns with cleft lip and palate for nasoalveolar molding

Department to refer	%
Plastic and Reconstructive Surgery	41
Pediatrics	39
Dentist	4
Orthodontist	10
Do not refer	6

Table 4. Comparison of obstetrician–gynecologists according to their level of knowledge about preoperative treatment of newborns with cleft lip and palate

Queries	Answer	Inexperienced	Experienced	*P**
Do you have any information about orthopedic applications performed before surgical treatment of CLP newborn?	Yes	44	20	.085
	No	42	35	
How many CLP newborn births have you ever seen?	None	8	3	.183
	0-4	60	33	
	5-10	9	13	
	> 10	9	6	
Have you heard about feeding plate/NAM in CLP newborns?	Yes	51	31	.730
	No	35	24	
Do you know what NAM is?	Yes	24	14	.749
	No	62	41	
Do you know who performed the NAM?	Yes	18	13	.705
	No	68	42	
Do you know for what purpose NAM is performed?	Yes	25	13	.478
	No	61	42	
Do you refer patients for NAM application?	Yes	20	13	.958
	No	66	42	

*Results of Pearson Chi-square test.
CLP, cleft lip and palate; NAM, nasoalveolar molding.

ethnicity, race, and geography. The combined prevalence of orofacial clefts is approximately 1 in 700 live births in Europe, with an ethnic and geographic variation.[12] According to Yılmaz et al.,[13] unilateral CLP was the most common cleft type, seen more on the left side, with patients mostly applying for treatment in university hospitals (64.9%).

Both genetic and environmental factors affect the risk of orofacial clefts. The development of facial structures occurs between the fourth and twelfth weeks of pregnancy, and the left and right sides of the facial structures fuse in the middle of these weeks. If these parts do not fuse properly, craniofacial clefts occur.[14] Cleft lip and palate can be diagnosed during pregnancy with ultrasonography and magnetic resonance imaging.[15]

An accurate prenatal diagnosis of CLP is critical for establishing long-term treatment planning, prognosis, and proper counseling with the parents.[9] The parents need to be informed and counseled about the severity of the cleft, the predicted outcome, and the options for repair by a trained cleft team. Although no intrauterine treatment exists for CLP, both parents and infants benefit from early diagnosis and counseling. The parents may take time to adjust to the reality of the condition and educate themselves about it. The initial shock of the diagnosis can usually be overcome with systematic and planned counseling.[16,17]

Maarse et al.[18] found a large discrepancy among studies, with prenatal detection rates with 2D ultrasound imaging ranging from 9 to 100% for cleft lip with or without cleft palate, 0-22% for cleft palate only, and 0-73% for all types of cleft. Using 3D imaging, the detection rate reached 100% for cleft lip, 86-90% for cleft lip with cleft palate, and 0-89% for cleft palate only. Additionally, Faure et al.[19] performed a study to define the prenatal ultrasound semiology of cleft palate without cleft lip using 3D visualization. They found that an axial transverse ultrasound view and visualization of the secondary fetal palate enables diagnosing a cleft palate without cleft lip. The prenatal diagnosis gave the parents time to manage their feelings, accept the child at birth, and prepare family and friends.[20] Early diagnosis also helped the parents to interact with similar parents and have a better understanding.[21] Clear and consistent information about CLP, possible treatments, and prognosis must be given during initial counseling at cleft centers to reduce anxiety, confusion, and uncertainty.[22,23] Most parents had concerns about the wellbeing of the child and especially the feeding techniques that can be adopted. Prenatal counseling helped to alleviate such concerns and led to more successful parenting.[24,25]

The general treatment protocol for CLP involves presurgical orthopedics, surgical repair of the lip and palate, and treatment of problems related to otology speech, and dental anomalies. Nasoalveolar molding is an important presurgical orthopedic technique for alignment and correction of the nasal cartilage, minimizing the formation of scar tissue and thus producing a more consistent postoperative result.[5] Nasoalveolar molding lengthens the columella, an important factor that can affect the aesthetic and functional results of lip surgery, especially in newborns with bilateral CLP. Eventually, a cleft is easier to repair by using NAM before surgery.[14]

Cleft lip and palate should be treated with a multidisciplinary approach involving many specialists including OB-GYNs,

pediatricians, speech therapists, plastic and reconstructive surgeons, and orthodontists. There are cleft centers in some countries where the parents are guided by the cleft teams whereas there are no centers in some countries. The parents may be referred to an orthodontist specialized in cleft care. It is important for OB-GYNs at the birth of a newborn with CLP to refer the patient to an orthodontist for rapid orthopedic treatment before surgery. In addition to their specialty education, CLP centers and societies may organize courses, conferences, and seminars for postgraduates to increase awareness for OB-GYNs. The major importance of NAM is that when used in conjunction with surgical lip repair, it allows a single initial surgery to address the nose, lip, and alveolar complex, thereby reducing the need for secondary surgery.[26] Matsuo et al.[27] concluded that the cartilaginous tissues of newborns are softer and their plasticity is higher due to the level of estrogen transferred from the mother. This plasticity facilitates reshaping discrete fragments. The plasticity of cartilaginous tissues lasts until approximately 3-4 months of age, after which the level of estrogen decreases, and the cartilage regains elasticity, so performing NAM as soon as possible after birth is important.

The results of this study reveal that OB-GYNs in Turkey did not have a good knowledge of presurgical orthopedics and NAM therapy. Fifty-nine of 141 (42%) OB-GYNs had never heard of NAM for newborns with CLP. Thirty-eight (27%) had information about NAM. Thirty-three (23%) referred newborns with CLP for NAM, and 108 (77%) did not. This is an important ratio because the success of presurgical orthopedic treatments is closely related to its commencement as soon as possible after birth. Unfortunately, parents who are not informed after birth and not directed to a specialist for NAM will be deprived of the benefits of presurgical orthopedics.

No statistically significant difference existed in the knowledge level of preoperative treatment of newborns with CLP between experienced and inexperienced OB-GYNs ($P > .05$). Knowledge and awareness of NAM in newborns with CLP among OB-GYNs was insufficient in our sample. We could not compare our findings with the literature since no previous study has evaluated the awareness of OB-GYNs about NAM.

Our study has some limitations. It could be done with a larger sample of participants. Unfortunately, of 532 OB-GYNs, only 141 participated, which is a low rate. This study was also conducted with participants from a single country. Therefore, conducting a study with a greater participation rate, a larger sample size, and more global participants is important.

CONCLUSION

Newborns with CLP should be treated with a multidisciplinary approach that involves many specialists including OB-GYNs. The awareness and knowledge of NAM among OB-GYNs are limited. Commencing the presurgical orthopedic treatment process as soon as possible after the birth of newborns' CLP is crucial for treatment success. Therefore, it is important to increase the awareness of OB-GYNs of CLP treatment alternatives, NAM, and presurgical orthopedic treatment through various courses and seminars during their specialty education.

Ethics Committee Approval: Ethics committee approval was received for this study from the Clinical Research Ethics Committee of Ordu University (No. 2020/220).

Informed Consent: N/A.

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