

Evaluation of Health Care Professionals' Knowledge and Attitudes Regarding Maternal Vitamin D Supplementation

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ABSTRACT:

Evaluation of health care professionals' knowledge and attitudes regarding maternal vitamin D supplementation

Objective: To determine the knowledge and attitudes of healthcare professionals regarding vitamin D supplementations in pregnant and breastfeeding mothers.

Material and Method: Our study was conducted between April and May 2015 with the participation of 752 healthcare professionals (pediatrician, pediatric resident, specialist family physician, family physician resident, general family practitioner and nurse). The study questionnaire was created by researchers in accordance with experiences and literature information. Ethics committee approval was obtained. In questionnaire along with the demographic characteristics of the participants, the knowledge and practices on vitamin D supplementation for pregnant women and nursing mothers were asked. The data were analyzed by percentage and chi-square tests.

Results: A total of 574 physicians (76.4%) and 178 nurses (23.6%) participated in our study. Of these, 418 (55.6%) participants suggested vitamin D supplementation to pregnant. The ratio of family physician specialists' recommendations of vitamin D supplementation (66.7%) was higher than the other groups ($p<0.001$). The highest dose of vitamin D supplementation suggested to pregnant was 800-1000 IU/day with a rate of 23.4%. A total of 451 of participants (60.0%) recommend vitamin D supplementation to breastfeeding mothers. Pediatric residents and specialists' recommendations of vitamin D supplementation rate (70.0% and 63.6%, respectively) were higher than the other groups ($p<0.001$). Highest rate of vitamin D supplementation recommended to breastfeeding mothers was 800-1000 IU/day with a rate of 27.0%. The rate of recommendation according to the Ministry of Health's recommendations to pregnant women with 1200 IU/day of vitamin D was 6.0% and breastfeeding mothers with 1200 IU/day of vitamin D was 4.5%.

Conclusion: We found that the rate of recommendation and doses of vitamin D supplementation to breastfeeding mothers and infants by healthcare professionals were low in our study. It has been determined that training programs for healthcare professionals should be organized in order to prevent vitamin D deficiency.

Keywords: Breastfeeding mothers, healthcare professionals, pregnant, vitamin D

ÖZET:

Saęlık alıřanlarının annelere D vitamini desteęi ile ilgili bilgi ve tutumlarının deęerlendirilmesi

Ama: Saęlık alıřanlarının gebe ve emziren anneye D vitamini desteęi hakkındaki bilgi ve tutumlarını belirlemek.

Gere ve Yöntem: alıřmamız Nisan - Mayıs 2015 tarihleri arasında, saęlık alanında halen aktif hizmet veren 752 saęlık alıřanının (pediatri uzmanı, pediatri asistanı, uzman aile hekimi, aile hekimi asistanı, pratisyen aile hekimi ve hemşire) katılımı ile yapıldı. alıřmanın anket formu arařtırmacılar tarafından deneyimler ve literatür bilgileri doęrultusunda oluřturuldu. Etik kurul onayı alındı. Ankette katılımcılara demografik özellikleri ile birlikte, gebe ve emziren annelere D vitamini desteęi konusundaki bilgi ve uygulamaları soruldu. Veriler yüzdeler ve ki-kare testleri ile deęerlendirildi.

Bulgular: alıřmamıza 574 hekim (%76.4) ve 178 hemşire (%23.6) katıldı. Katılımcıların 418'i (%55.6) gebelere D vitamini desteęi önermekteydi. Uzman aile hekimlerinin (%66.7) gebelere D vitamini desteęi önerme oranı dięer gruplardan yüksekti ($p<0.001$). Gebelere D vitamini en yüksek oranda (%23.4) 800-1000 IU/gün dozunda önerilmekteydi. Katılımcıların 451'i (%60.0) emziren annelere D vitamini desteęi önermektedir. Pediatri asistanları (%70.0) ve pediatri uzmanlarının (%63.6) emziren annelere D vitamini verme oranı dięer gruplardan yüksekti ($p<0.001$). Emziren annelere en yüksek oranda (%27.0) 800-1000 IU/gün dozunda D vitamini önerildięi belirlendi. Saęlık Bakanlıęının önerisine uygun gebelere 1200 IU/gün D vitamini öneren oranı %6.0, emziren annelere 1200 IU/gün D vitamini önerenlerin oranı %4.5 idi.

Sonuç: alıřmamızda saęlık alıřanlarının emziren annelere ve gebelere D vitamini desteęi önerme oranının ve dozunun düşük olduęu belirlendi. D vitamini yetersizlięinin önlenmesi için saęlık alıřanlarına yönelik eğitim programlarının düzenlenmesi gerektięi belirlenmiştir.

Anahtar kelimeler: Emziren anneler, saęlık alıřanları, gebeler, vitamin D

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INTRODUCTION

Vitamin D deficiency and rickets continue to be a health problem in developing countries (1,2). It has been found that vitamin D also has antiinflammatory, immunomodulatory and antineoplastic effects besides its effects on preservation and mineralization of bone structure (3). Vitamin D sources in babies are by placental transfer, breast milk and synthesis through skin from sunlight. Serum 25-Hydroxy (OH) D levels of infants in the first two months of life correlate with their mothers, and sunlight is more decisive in the following months (4).

In recent years, studies have shown that lack of vitamin D on the basis of biological association of mother and baby is a common problem of mother and baby. In this framework, defining the deficiency of perinatal vitamin D has become important (5). In order to maintain normal calcium balance during the pregnancy and lactation period of the mother and prevent vitamin D deficiency in the baby during early neonatal period, the maternal vitamin D level should be sufficient (2,6).

In order to eliminate vitamin D deficiency in our country, free distribution of 400 IU D daily is provided for infants under one year, since 2005 (7). "Vitamin D for Pregnants Program" is being carried out since May 2011 in order to eliminate the deficiency of Maternal vitamin D. In this program, 1200 IU vitamin D supplement is recommended daily from the 12th week of pregnancy to 6 months postpartum (8).

We aimed to determine the knowledge and attitudes of healthcare professionals who are an important step in the practice and maintenance of vitamin D supplementation, about maternal vitamin D supplementation during pregnancy and lactation.

MATERIAL AND METHOD

Our study was performed descriptively and cross-sectionally between April and May 2015. 752 healthcare professionals who accepted the questionnaire on the basis of voluntarism formed the sample. The study was approved by the ethics committee of Sisli Hamidiye Etfal Training and Research Hospital (490/2015).

Participants were interviewed face-to-face and informed about the study. Informed consents of healthcare professionals who agreed to participate in the study were included with the questionnaire form. Participants were asked to complete a questionnaire consisting of nine questions. Survey form was created by researchers using literature information and their own experiences. In the survey conducted, the participants were asked about their academic titles, the institutions they work and the period of graduation from university, and whether they recommend vitamin D to pregnant – at which dose they recommend- whether they recommend additional calcium, whether they recommend vitamin D supplementation to breastfeeding mothers – at which dose they recommend- and whether they recommend additional calcium.

Study Group

Pediatrician, pediatric resident, specialist family physician, family medicine resident, general family physician and nurses who are currently active in the health field were included in the study.

Statistics

SPSS 15.0 for Windows program was used for statistical analysis. Descriptive statistics were given as number and percentage for categorical variables. Chi-square analysis was used for ratio comparisons in independent groups. Monte Carlo simulation was applied when conditions were not met. Statistical significance level of alpha was accepted as $p < 0.05$.

RESULTS

There were 752 healthcare professionals, including 574 physicians (76.4%) and 178 nurses (23.6%) in our study. The demographic characteristics of the participants are shown in Table-1.

Opinions on Vitamin D Support in Pregnancy: Of the participants included in the study, 418 (55.6%) recommended vitamin D supplementation in pregnancy, while 193 (25.7%) did not. One hundred and forty-one (18.8%) participants did not give an

Table-1: Distribution of participant demographics

		n	%
Akademic Title	Pediatric Resident	110	14.6
	Family Physician Resident	115	15,3
	General Family Practitioner	137	18.2
	Specialist Family Physician	105	14.0
	Pediatrician	107	14.2
	Nurse	178	23.6
Working Institution	Family Health Center	322	42.8
	State Hospital	40	5.3
	Training and Research Hospital	304	40.4
	University Hospital	67	8.9
	Other	19	2.5
Period of graduation from university	Less than 5 years	238	31.6
	Between 5-10 years	211	28.1
	Between 11-20 years	197	26.2
	More than 20 years	106	14.1

Table-2: Participants' distribution of opinions on pregnant and lactating mothers on vitamin D supplementation

		n	%
Recommends vitamin D supplement to pregnant	Yes	418	55.6
	No	193	25.7
	No comment	141	18.7
Dose of vitamin D recommended to pregnant	Daily 800-1000IU	176	23.4
	Daily 400IU	106	14.1
	Daily 1200IU	45	6.0
	Daily 2000IU	24	3.2
	1 ampule each month	17	2.3
	Ampule for once	7	0.9
	Daily 5000IU	6	0.8
	No comment	371	49.3
	Calcium recommendation in addition to vitamin D to pregnant	Yes	298
No		239	31.8
No comment		215	28.6
Recommends vitamin D supplement to breastfeeding mothers	Yes	451	60.0
	No	231	30.7
	No comment	70	9.3
Dose of vitamin D recommended to breastfeeding mothers	Daily 800-1000IU	203	27.0
	Daily 400IU	147	19.5
	Daily 1200IU	34	4.5
	1 ampule each month	22	2.9
	Ampule for once	14	1.9
	Daily 5000IU	10	1.3
	No comment	322	42.8
Recommends calcium in addition to vitamin D supplement to breastfeeding mothers	Yes	318	42.3
	No	290	38.6
	No comment	144	19.4

opinion on this issue (Table-2). The ratio of specialist family physicians (66.7%) to recommend vitamin D support to pregnant was higher than that of the general family physicians (61.3%), nurses (61.2%),

family medicine residents (54.8%), pediatricians (44.9%) and pediatric residents (40.0%). The ratio of not having an opinion for recommending vitamin D supplements to pregnant of pediatricians (43.0%)

Table-3: Correlation between doses of vitamin D recommended for pregnant and academic titles

Recommended vitamin D dose	Pediatric Resident n (%)	Family Medicine Resident n (%)	General Family Practitioner n (%)	Specialist Family Physician n (%)	Pediatrician n (%)	Nurse n (%)	p
400 IU/day	16 (14.5)	16 (13.9)	22 (16.1)	19 (18.1)	13 (12.1)	20 (11.2)	0.001
800-1000 IU/day	19 (17.3)	30 (26.1)	30 (21.9)	35 (33.3)	30 (28.0)	32 (18.0)	
1200 IU/day	1 (0.9)	7 (6.1)	11 (8.0)	12 (11.4)	1 (0.9)	13 (7.3)	
2000 IU/day	3 (2.7)	4 (3.5)	7 (5.1)	3 (2.9)	0 (0.0)	7 (3.9)	
5000 IU/day	0 (0.0)	1 (0.9)	1 (0.7)	1 (1.0)	1 (0.9)	2 (1.1)	
Vitamin D ampule for once	1 (0.9)	0 (0.0)	1 (0.7)	1 (1.0)	0 (0.0)	4 (2.2)	
Vitamin D ampule each month	2 (1.8)	7 (6.1)	3 (2.2)	0 (0.0)	1 (0.9)	4 (2.2)	

Table-4: Correlation between doses of vitamin D recommended for lactating mothers and academic titles

Recommended vitamin D dose	Pediatric Resident n (%)	Family Medicine Resident n (%)	General Family Practitioner n (%)	Specialist Family Physician n (%)	Pediatrician n (%)	Nurse n (%)	p
400 IU/day	40 (36.4)	20 (17.4)	23 (16.8)	17 (16.2)	23 (21.5)	24 (13.5)	
800-1000 IU/day	26 (23.6)	40 (34.8)	30 (21.9)	36 (34.3)	37 (34.6)	34 (19.1)	
1200 IU/day	0 (0.0)	3 (2.6)	9 (6.6)	10 (9.5)	1 (0.9)	11 (6.2)	
5000 IU/day	0 (0.0)	2 (1.7)	2 (1.5)	0 (0.0)	3 (2.8)	3 (1.7)	
Vitamin D ampule for once	5 (4.5)	1 (0.9)	2 (1.5)	2 (1.9)	0 (0.0)	4 (2.2)	
Vitamin D ampule each month	2 (1.8)	6 (5.2)	6 (4.4)	3 (2.9)	1 (0.9)	4 (2.2)	

and pediatric residents (42.7%), was higher than that of nurses (13.5%), family medicine residents (9.6%), specialist family physicians (6.7%) and general family practitioners (4.4%) ($p < 0.001$).

The answers to the question "What is the dose of vitamin D you recommend to pregnant?" are presented in Table-2. It was detected the highest ratio (33.3%) of recommendation was from the specialist family physicians at a dose of 800-100 IU/day of vitamin D. The correlation between the doses of vitamin D recommended to pregnant and academic titles is presented in Table-3.

To the question "Do you also recommend calcium supplements besides vitamin D to pregnant?", 298 (39.6%) of the respondents answered yes, 239 (31.8%) answered no and 215 (28.6%) did not give an opinion on this subject. Among the groups, specialist family physicians (51.4%) had the highest rate of giving calcium along with vitamins D in pregnancy. Among the non-responders, the rate of pediatric residents (53.6%) and pediatricians (52.3%) were higher than the others ($p < 0.001$).

Opinions on Vitamin D Support for Breastfeeding

Mothers: Of the participants included in the study, 451 (60.0%) recommended vitamin D supplementation to breastfeeding mothers, while 231 (30.7%) did not. About 70 of them (9.3%) did not give an opinion. The ratio of recommendation of vitamin D supplement to breastfeeding mothers of pediatric residents (70.0%) and pediatricians (63.6%) were higher than the other groups ($p < 0.001$).

The distribution of answers to the question "What is the dose of vitamin D you recommend to breastfeeding mothers?" were as follows: 203 (27.0%) recommending 800-1000 IU/day, 147 (19.5%) 400 IU/day, 34 (4.5%) 1200 IU/day, 22 (2.9%) 1 ampule each month, 14 (1.9%) 1 ampule for once and 10 (1.3%) 5000 IU/day, while 322 (42.8%) didn't give their opinion about this issue. Correlation between doses of vitamin D recommended for breastfeeding mothers and academic titles is presented in Table-4. The highest ratio of not giving an opinion about the dose of vitamin D supplementation recommended to breastfeeding mothers belonged to nurses (55.1%) ($p < 0.001$).

To the question "Would you recommend calcium

supplementation with vitamin D in breastfeeding mothers?", 318 (42.3%) of the participants said yes, 29 (38.6%) said no and 144 (19.1%) did not give an opinion on this issue. The rate of giving calcium (52.7%) with vitamin D in breastfeeding mothers of pediatric residents was higher than the other groups. Pediatricians (32.7%) reported the have the highest rate among those who did not comment on giving calcium along with vitamin D in breastfeeding mothers ($p < 0.001$).

DISCUSSION

Recent studies have shown that maternal vitamin D deficiency may be associated with increased frequency of neonatal hypocalcemia and infantile rickets as well as eclampsia / preeclampsia, increased frequency of physiological craniotables, low birth weight / prematurity, dental / enamel hypoplasia, congenital cataract, childhood diabetes mellitus, multiple sclerosis, depression and bipolar disorder (9-14). It is suggested that vitamin D affects fetal brain and immune system development. It is reported that the effect of vitamin D deficiency on the newborn during pregnancy may be permanent and this condition may not be corrected with vitamin D support which will be given later (15-18).

Fetus D vitamin level is completely dependent on the vitamin D deposits of mother; if mother's vitamin D level is insufficient, vitamin D level in fetus will be inadequate. In a study conducted in our country, it has been shown that the mother 25-hydroxy-vitamin D level is the most important risk factor for low levels of 25-hydroxyvitamin D in newborns (19).

Different rates of the incidence of maternal vitamin D insufficiency have been reported in different countries (20-24). In our country, the studies performed in the last 10 years revealed a rate of 46-80% of vitamin D deficiency in pregnant women or women of childbearing age (6,19,25-28). For this reason, "Vitamin D for Pregnants Program" is being carried out since May 2011 in order to eliminate the deficiency of Maternal vitamin D. In this program, 1200 IU vitamin D supplement is recommended daily from the 12th week of pregnancy to 6 months postpartum (8).

Controversy continues on the proposed vitamin D dose for pregnant women. It is accepted that doses below 1000 units per day (especially in areas at risk for lack of vitamin D) are inadequate for support (29,30). In a study comparing the daily doses of 400, 2000 and 4000 IU vitamin D in pregnant women, it was shown that the most effective dose was 4000 IU/day and this dose of vitamin D supplementation was recommended to pregnant women. As a result, although not yet widely practiced, there is a consensus on the provision of at least 1000, preferably 2000 IU/day of vitamin D in pregnancy and lactation and this dose is safe (31,32).

In our study, we found that about half of healthcare professionals give vitamin D supplements to pregnant. Specialist family physicians were the group that recommended vitamin D supplementation to pregnant the most. It was determined that the daily dose of vitamin D recommended by the participants in the survey was below the important recommended dose of vitamin D. Only 6.0% of healthcare professionals participating in our study suggested the application of 1200 IU D daily given to the pregnant women in line with the program implemented by the Ministry of Health. It was determined that although the specialist family physicians and general family practitioners were in the group of healthcare professionals who were following the pregnant women, they applied the Ministry of Health's recommendation at a very low rate.

A number of studies have been conducted to demonstrate that maternal vitamin D activity depends on maternal vitamin D status (33-36). The mean vitamin D content of breast milk of mothers with adequate levels of vitamin D is 22 IU/L (15-50 IU/L), which is much lower than the daily vitamin D needs (400 IU/day) of babies (37). The amount of vitamin D in the milk of mothers who take 400 IU/day vitamin D supplementation ranges from 25-78 IU L (33,34,36-40). Mothers who take high dose vitamin D (up to 6400 IU per day) supplements showed up to 873 IU/L of vitamin D concentration in their milk without developing any vitamin D intoxication findings (38,39). There are also recent publications in the literature reporting that maternal

administration of vitamin D supplementation with highdose(6400IU/day)ofvitaminDsupplementation during lactation provides sufficient vitamin D levels in infants (41).

Approximately half of the healthcare professionals in our study were found to recommend vitamin D supplement to their breastfeeding mothers. This rate is not at the desired level. In our study, it was determined that the recommended dose of vitamin D for the breastfeeding mothers was usually 800-1000 IU per day. This dose given to mothers is appropriate because the Ministry of Health provided vitamin D supplementation (400 IU per day) to infants from 2005 onwards. However, in line with the Ministry of Health "Vitamin D Support Program for Pregnancy", breastfeeding mothers are recommended 1200 IU vitamin D daily for the first 6 months. It was seen that the specialist family physicians and general family practitioners performed this recommendation at higher rates than the other groups, but well below the expected rate.

The fetus is dependent on the mother for calcium and phosphorus, which are necessary for bone development and tissue growth. At the end of the pregnancy, approximately 25-30 grams of calcium will be transferred to the fetus (42,43). Studies have shown that there is a 2-4% decrease in bone mineral density in the mother after pregnancy, which is most pronounced in the spine and distal radius (44-47). Inadequate calcium intake leads to a reduction in the calcium content of the mother's milk and impaired bone growth in the baby. It is recommended to take 500 mg/day of calcium in addition to the daily requirements of pregnant and lactating mothers (48). Approximately one-third of the participating healthcare professionals suggesting pregnant and

breastfeeding mothers calcium supplementation with vitamin D, suggests that their consciousness level should be raised.

CONCLUSION

It is known in our country that there is a common problem of vitamin D deficiency in the age of fertility and in pregnant women and that it continues during lactation period, which develops risks for both mother and infant. Provision of vitamin D supplementation to pregnant and breastfeeding mothers is important for health of pregnant and fetus. The Ministry of Health has vitamin D support programs in place (400 IU/day for babies, 1200 IU/day for pregnant and breastfeeding mothers). In our study, it was determined that the rate of healthcare professionals recommending vitamin D for pregnancy was detected to be 55.6% and they mostly recommend 800-1000 IU vitamin D daily. It was found that the rate of recommendation vitamin D to breastfeeding mothers was 60% and vitamin D was recommended at a dose of 800-1000 IU per day. The rate of the healthcare professionals who recommended 1200 IU/day vitamin D to pregnant according to the recommendation of the Ministry of Health was 6,0% and the rate of healthcare professionals who recommended 1200IU/day vitamin D to breastfeeding mothers was 4.5%. Both rates were found to be quite low.

Regulation of training programs for healthcare professionals will increase compliance with strategies developed to prevent vitamin D insufficiency and ensure that vitamin D supplementation is given at doses appropriate to the current recommendations.

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