

A study to assess the effect of Iranian traditional medicine regimen for women in prevention of neonatal non-physiologic jaundice

Hamid Reza Sheikh Roshandel^{1*}, Fateme Ghadimi¹ & Romina Sheikh Roshandel¹

¹*Taamasrar Institute, number 41, Rasa building, Abolfazl street, Marzadaran, Tehran, Iran
E-mail: hamidreza.roshandel@yahoo.com

Received 12 September 2016, revised 06 October 2016

In Iranian traditional medicine foods of cold nature are prescribed to pregnant women in order to prevent pathologic jaundice in their newborn. This interventional study was conducted to assess the effect of diet of cold nature, during pregnancy on non-physiological jaundice occurrence in new born. The intervention group included 70 pregnant women who received diet based on food with cold nature. The control group included 70 women referred to one of hospitals in Tehran city for delivery purpose. Appearance of clinical neonatal jaundice within 24 hrs of birth was significantly more among neonates born from mothers in control group compared to neonates born from mothers in intervention group ($p=0.002$). This study showed some beneficiary effect of consumption of food with cold nature in reducing neonatal non-physiologic jaundice, however, further studies with larger sample size and controlled condition are required on this subject.

Keywords: Neonatal jaundice, Diet, *Mizaj*, Iranian traditional medicine, Cold nature, Temperament

IPC Int. Cl.⁸: A61K 36/00, A23L 33/00, A01D 7/31, A01D 7/

Neonatal Jaundice is a common condition which occurs in around 60 % of newborn sometimes during the first week of life¹. This percentage is more among the preterm newborns and is as high as 80 %. In 10 % of children breast feed exclusively, jaundice may occur in the first month of their life². Hemolysis of fetal red blood cells and inability of neonatal liver to clear bilirubin rapidly from the blood are the main causes of neonatal jaundice³⁻⁵. Neonatal jaundice is mostly considered as a benign physiologic morbidity which will disappear without any intervention and without any sequel, but it is considered as non-physiologic if Total Serum Bilirubin (TSB) level exceed 6 mg/dl on the first 24 hrs of the life of newborn (clinical jaundice), TSB more than 12.9 mg/dl thereafter or presence of clinical jaundice beyond three weeks⁶. Clinical jaundice is appearance of yellowish color of skin and sclera which could develop from head to foot². Neonatal hyperbilirubinemia can affect adversely the central nervous system due to toxicity of bilirubin, which in severe cases can result in bilirubin encephalopathy and subsequently kernicterus, permanent neurodevelopmental damage resulting in handicap or even deaths^{1,7-8}. It has been estimated that in 2010

around 24 million newborns were at risk of adverse outcomes of neonatal hyperbilirubinemia, which a total of 110000 of deaths among them⁹.

Yet, the etiology of pathologic jaundice is not yet fully known¹⁰. Different risk factors like maternal diabetes, preterm delivery, some medication during pregnancy, polycythemia, male infant, trisomy 21, cephalohematoma, breastfeeding, weight loss, delayed meconium passage, history of jaundice in the family, incompatibility RH, mode of delivery, maternal syphilis, rubella, congenital infections such as toxoplasmosis and maternal age have been identified as risk factors with some degrees of uncertainties¹¹⁻¹³. Phototherapy is the widely used treatment of hyperbilirubinemia. Phototherapy changes the structure of bilirubin and converts it to more water soluble forms that can be excreted easily¹. However, there are few reports of clinically significant toxicity of phototherapy¹⁴⁻¹⁵.

Phototherapy can cause bronze baby syndrome in infants with cholestasis¹⁶⁻¹⁷. Rare cases of purpuric and bullous eruptions have also been reported¹⁸⁻¹⁹. Phototherapy has severe contraindications with family history of porphyria, and concomitant use of photosensitizing drugs or other agents¹. Peripheral blood flow and insensible water loss in newborn due to thermal change are other side effects of

*Corresponding author

phototherapy²⁰⁻²¹. In addition, yet the psychological effect to the newborn and the parents due separation for phototherapy or hospitalization are not fully known or measured. Therefore, finding more safe preventing measure for neonatal pathologic jaundice is useful in lowering the burden on health care system and families. Iranian traditional medicine is a holistic medicine that promotes prevention rather than treatment of diseases. It is based on four elements theory. The four elements influence each other and produce unique quality which is called temperament²²⁻²⁴. Health is maintained when temperaments are normal in quantity and quality, and in well mixed condition²⁵. In this medicine, jaundice is attributed to the hot temperament and prevention of neonatal jaundice is also seen in the light of this view²⁶⁻²⁷. Traditionally, extracts or food of cold nature are prescribed to pregnant women in order to prevent pathologic jaundice in the newborn in Iran. Many recent studies have shown that still this practice is exercised in Iran. A study by Khorshidifard *et al.* (2015) in Kazeroon city showed that more than 80 % of women believed that consuming food with hot nature during pregnancy could elevate jaundice syndrome in their newborn and around 70 % of them used extracts of chicory or cotoneaster, which are known by having cold nature, during their pregnancy²⁸.

Therefore, this interventional study was conducted to assess the effect of diet of cold nature, based on traditional medicine, during pregnancy on non-physiological jaundice occurrence in new born.

Methodology

A quasi-experimental study was conducted between 2015 and 2016 in Tehran city, Iran to assess the effect of Iranian traditional medicine regimen (consuming food with cold nature) by pregnant mothers in prevention of neonatal non-physiologic jaundice compared to a control group.

Subjects

The intervention group included 70 pregnant women who referred to Taamasrar clinic and received pregnancy diet based on Iranian traditional medicine consisted of food with cold nature. The control group included 70 women referred to one of hospitals in Tehran city for delivery purpose, who reported not using any foods or prescription of Iranian traditional medicine for prevention of neonatal jaundice during pregnancy.

Eligibility criteria for intervention group included compliance with the given diet for a minimum of one month during the last trimester of pregnancy or a minimum of three months during the whole pregnancy period with a self-reported compliance level of above 5 on a scale from 1 to 10. The exclusion criteria included any kind of chronic illness or using any medication for acute diseases during pregnancy. As using extracts of chicory or cotoneaster during pregnancy is very common in Iran, those women in control groups who reported consuming these items or any other items based on Iranian traditional medicine for prevention of neonatal jaundice were excluded from the study.

Sample size and sampling technique

Sample size was calculated as 70 cases in each group based on the formula for comparing two proportions, while the confidence level was set as 95 %, study power of 80 % and the estimated difference in proportion among two groups as minimum 15 %.

Sampling in control group was done by random selection among pregnant cases that referred to Taamasrar clinic for nutrition counseling during pregnancy in duration of one year prior to the interview date via the medical records. Control group was selected randomly among women who refereed for delivery to one of private hospitals in Tehran city. Data collection team referred to the hospital on random days during a week and collected data of all the delivery cases that were to be discharged from hospital on that day.

Intervention

A special diet of cold nature food or extracts of natural plants during pregnancy was prescribed for pregnant women. Foods and fruits and vegetable known for its cold nature, based on the book of "*Riaz al advia*" by Yoosefi Haruni were included in a diet that met all nutritional requirements during pregnancy²⁹. There were 9 types of regimen, each regimen for 7 days. These 9 types of regimen were modified based on nutritional need of pregnant women during each trimester of pregnancy in each visit of pregnant women. Iranian traditional medicine prescription for prevention of neonatal jaundice was the basis of this diet.

The pregnant women were followed monthly for compliance to the diet and also for any kind complication during pregnancy.

Main outcome of the study

Occurrence of non-physiological jaundice based on the below criteria of manifestation of clinical jaundice on the first day of life, or a TSB level more than 12.0 mg/dl and presence of clinical jaundice more than three weeks were the main outcome of the study.

Data collection tool

Data collection tool included data collection forms, which elicited demographic information, information related to pregnancy and delivery, and TSB level, in case it was measured by blood test.

Data collection procedures

All pregnant women referred to Taamasrar Clinic for pregnancy diet during 2015 were followed till one month after delivery. Information related to compliance to the prescribed diet, their pregnancy, delivery and occurrence of neonatal jaundice were collected during pregnancy and one month after delivery and those who were eligible based on inclusion and exclusion criteria enrolled in the study. In case of control group, data collection was done from those women who referred to one of the private hospitals of Tehran city for delivery. Data related to their pregnancy, delivery and using any kind of prescription of Iranian traditional medicine for prevention of neonatal jaundice was elicited in the hospital after delivery and before hospital discharge.

Data related to neonate jaundice was elicited one month after delivery for the eligible women.

Statistical analysis

Descriptive statistics like mean (SD) and frequency (percentages) was used to describe the data. Chi square test and students T test was used to compare the qualitative and quantitative data among the two groups.

Ethical consideration

The intervention included those items that traditionally are consumed by pregnant women in Iran and is known as being harmless. The purpose of the study was explained to pregnant women and written consent was obtained from both groups. The study was approved by ethical committee of Tehran University of Medical Sciences.

Results

Table 1 shows comparison of demographic and pregnancy related information among the intervention and the control groups. There was no significant difference in mean age of mother, educational level, occupation, RH incompatibility and history of pathologic neonatal jaundice in previous children among intervention and control groups ($P > 0.05$). Vaginal delivery was significantly more among intervention group compared to control group

Table 1 — Demographic and pregnancy related information among the intervention and the control groups.

Characteristics	Intervention group Mean (SD)	Control group Mean (SD)	P-value (test value)
Age	30.90±0.48	31.54±0.56	0.384 (t= -1.235)
Education	Number (Percentage)		
Below Diploma	1 (1.4%)	1 (1.4%)	0.279 ($X^2=7.394$)
Diploma	23 (31.8%)	31(44.3%)	
Bachelor	44(67.3%)	32(45.7%)	
Master and above	2 (2.9%)	6 (8.6%)	0.957 ($X^2=0.560$)
Occupation			
Housewife	50(71.4%)	49(71.0%)	
Employee	20(28.6%)	20 (29.0%)	
RH incompatibility			0.528 ($X^2=2.124$)
Yes	42(73.3%)	41(78.8%)	
No	15(26.3%)	11(21.2%)	
History of pathologic neonatal jaundice in previous children			0.213 ($X^2=3.695$)
Yes	39(57.4%)	31(44.3%)	
No	29(42.6%)	38(54.3%)	
Type of delivery			0.016 ($X^2=7.752$)
Vaginal	15(21.4%)	5(7.1%)	
cesarean section	55(78.6%)	65(92.9%)	

(21.4 % vs. 7.1 %) ($p = 0.016$). Table 2 shows information related to the neonates born from mothers in control and intervention groups. There was no significant difference in preterm delivery and any neonatal disease among the two groups ($P > 0.05$). However, exclusive breast feeding ($p = 0.011$) and the day of meconium pass ($p = 0.000$) was significantly different between neonates born from intervention groups and control groups. 63.8 % of neonates born by women in intervention group were exclusively breast fed in the first month of birth while this percentage was 85.4 % among neonates born by women in control group. Also, 65.7 % of neonates of intervention group passed meconium in the first day of birth while this percentage was 89.1 % among neonates of control group. Information related neonatal non-physiologic jaundice is shown in Table 3. Appearance of clinical neonatal jaundice within 24 hrs of birth was significantly more among neonates born from mothers in control group compared to neonates born from mothers in intervention group ($p = 0.002$). In the intervention group, 11.4 % of cases reported appearance of clinical neonatal jaundice within 24 hrs of birth; however this proportion was

24.3 % in the control group. Neonatal jaundice lasted more than 3 weeks was reported for 4.3 % of neonates born from mothers in intervention group, but this proportion was 10 % for neonates born from mothers in the control group, but this difference was not significant, statistically ($p = 0.103$). TSB, although an important neonatal jaundice related data, could not be used in this study, because TSB measure was not done or this information was not available to mother in more than 87.2 % of control group and in 50 % of cases in intervention group. However, for those that this data was available, mean TSB level was significantly higher in neonates born from mothers control group compared to intervention group ($p = 0.024$) for those who has TSB level more than 12.9 mg/dl.

Discussion

Neonatal non-physiologic jaundice is a harmful^{2,3,6} and sometimes neglected illness of newborns³⁰, which is the most common cause of hospitalization of new borns³¹. The main intervention known for it, phototherapy, is not completely safe and in addition to financial burden, sometimes has contradiction with some health condition of newborns¹. Traditionally and

Table 2 — Information related to the neonates born from mothers in control and intervention groups

Characteristics	Intervention group number (%)	Control group number (%)	P-value
Preterm Infants			
Yes	0 (0.0%)	2 (2.9%)	0.154 ($X^2=2.116$)
No	70(100%)	68 (97.1%)	
Exclusive breast feeding in the first two weeks			
Yes	44 (63.8)	41 (85.4)	0.011 ($X^2=3.328$)
No	25 (36.2)	7 (14.6)	
Any Neonatal diseases			
Yes	1 (1.4%)	4(8.2%)	0.158 ($X^2=33.274$)
No	69(98.6%)	45(91.8%)	
Meconium pass			
First day	46 (65.7%)	57 (89.1%)	0.000 ($X^2=20.881$)
Second day	13 (18.6%)	2 (3.1%)	
Third day	10 (14.3%)	1 (1.6%)	
Don't remember	1 (1.4%)	4 (6.3%)	

Table 3 — Neonatal non-physiologic jaundice related data among the neonates born from mothers in control and intervention groups

Neonatal jaundice related data	Intervention group Number (%)	Control group Number (%)	P-value
Appearance of clinical neonatal jaundice within 24 hours of birth	8 (11.4)	17 (24.3)	0.002 ($X^2=5.388$)
Presence of neonatal jaundice more than two weeks	3 (4.3)	7 (10.0)	0.103 ($X^2=3.368$)
Pathologic neonatal jaundice based either of the above criteria	11 (15.7)	18 (25.7)	0.023 ($X^2=5.156$)
	Mean (SD)		
Mean TSB level if TBS > 12.9 mg/dl	15.7 (1.8)	17.8 (4.5)	0.024 ($t=4.306$)

widely accepted in Iran, food and plants known by cold temperaments are used by pregnant mothers to prevent occurrence of pathologic jaundice in neonates^{28,30,32}, but no scientific evidence was generated to evaluate effectiveness of this practice. Therefore, for the first time, this interventional study was conducted to assess the association of consumption of foods with cold nature during pregnancy on the neonatal non-physiologic jaundice. The results of this study showed that consumption of food with cold nature was effective in reducing occurrence of clinical neonatal jaundice within 24 hrs of life and in lowering on average the measure of TSB level.

This finding is consistence with the finding of a clinical trial by Khoshdel & Kheiri on the effect of cotoneaster (billinaster drop) consumption by the neonates or their mothers on the neonatal icter, which was done among 4 groups each with 30 members after adjustment of age and bilirubin level. The first group was treated with phototherapy and only their mothers received billinaster. The second group was treated with phototherapy and the mothers and neonates received billinaster. In the third group only neonates received billinaster and phototherapy and the last group was treated with phototherapy and placebo. Serum bilirubin level was assayed 12 hrs, 24 hrs, 36, 48 and 72 hrs after treatment. The result of their study showed that consumption of billinaster drop (known for its cold nature) can cause a significant decrease in neonatal icter and also decrease in the hospitalization period³³.

Still in developing countries, neonatal jaundice contributes, substantially to the neonatal morbidity and mortality^{31,34}, therefore, this new very safe and cost effective intervention could be very beneficiary in lowering the risk of neonatal jaundice related morbidity and mortality in these countries. This study showed that presence of non-physiological jaundice based on two criteria of clinical jaundice in the first 24 hrs of life and presence of neonatal jaundice more than two weeks was 15.7 % among newborns in intervention groups and 25.7 % among newborn in control groups. Similar results have been shown in some studies. In a study by Sarici *et al.* it was shown that 10.5 % in the term group and 25.3 % of the near-term group had significant hyperbilirubinemia which required phototherapy³⁵. In a study in Gonabad city, Iran, among 170 newborn during one year study period showed a prevalence of pathologic jaundice of 15.2 %³⁶. However, many studies reported lower rate of non-physiologic neonatal jaundice³⁷⁻³⁸. This study

showed that baseline data was not different between the two groups but cesarean section was less in intervention group and also exclusive breast feeding. This may be due to the fact that intervention group was selected among the pregnant women who referred to a nutrition research clinic which practices a combination of traditional medicine and modern medicine. Those who are more willing to practice traditional medicine are more willing to have vaginal delivery. Some studies showed that cesarean section decreases the risk of neonatal jaundice³⁹. Therefore, higher level of cesarean sections in control groups may acted as a confounding factor which masked the effect of cold temperament diet in lowering the risk of neonatal jaundice. However, in both groups vaginal delivery ratio was very low compared to the international standards, this is a challenging scenario in Iran which was previously reported⁴⁰⁻⁴¹. In this study, all mother breastfeed their newborns, but exclusive breast feeding which is encouraged by world health organization⁴² was significantly more among mothers in the control groups. In Iranian traditional medicine giving sugar water to newborn is a common practice, therefore, a proportion of mothers in the intervention group reported that they gave sugar water to their newborn, this may prevented dehydration and severe newborn weight loss, the two risk factors of neonatal jaundice^{2-3,12} and may acted as confounding factors. This study showed beneficiary effect of consumption of food with cold nature, a very safe and easy to apply intervention, in reducing neonatal non-physiologic jaundice, however, further studies with larger sample size and controlled condition are required on this subject.

The main limitation in the present study was insufficient available data about TSB level for most of cases in control group, and therefore, clinical measures were the main measures that were used in this study. This shows the importance of raising awareness of mothers about the importance of measuring TSB as a marker for pathologic neonatal jaundice in Iran and other developing countries.

Acknowledgement

Financial support from Pourateb Co. is acknowledged.

References

- 1 Maisels MJ & McDonagh AF, Phototherapy for neonatal jaundice, *N Engl J Med*, 358 (2008) 920-928. <http://dx.doi.org/10.1056/NEJMct0708376>

- 2 National Collaborating Centre for Women's and Children's Health (UK), Neonatal Jaundice (NICE Clinical Guidelines 98), London: RCOG Press, 2010.
- 3 Dennery PA, Seidman DS & Stevenson DK, Neonatal hyperbilirubinemia, *N Engl J Med*, 344 (2001) 581-590. <http://dx.doi.org/10.1056/NEJM200102223440807>
- 4 Kaplan M, Muraca M, Hammerman C, Rubaltelli FF, Vilei MT, *et al.*, Imbalance between production and conjugation of concept in the mechanism of neonatal bilirubin: a fundamental jaundice, *Pediatrics*, 110 (2002) e47. <http://www.pediatrics.org/cgi/content/full/110/4/e47>. (accessed 04.02.2008)
- 5 Maisels MJ & Kring E, The contribution of hemolysis to early jaundice in normal newborns, *Pediatrics*, 118 (2006) 276-279. <http://dx.doi.org/10.1542/peds.2005-3042>
- 6 Mishra S, Agarwal R, Deorari AK & Paul VK, Jaundice in the newborns, *Indian J Pediatr*, 75 (2008) 157-163. <http://dx.doi.org/10.1007/s12098-008-0024-7>
- 7 American Academy of Pediatrics, Practice parameter: management of hyperbilirubinemia in the healthy term newborn, *Pediatrics*, 94 (1994) 558-565.
- 8 Barateiro A, Chen S, Yueh MF, Fernandes A, Domingues HS, *et al.*, Reduced Myelination and Increased Glia Reactivity Resulting from Severe Neonatal Hyperbilirubinemia, *Mol Pharmacol*, 89 (2016) 84-93.
- 9 Bhutani VK, Zipursky A, Blencowe H, Khanna R, Sgro M, *et al.*, Neonatal hyperbilirubinemia and Rhesus disease of the newborn: incidence and impairment estimates for 2010 at regional and global levels, *Pediatr Res*, 74 (2013) 86-100. <http://dx.doi.org/10.1038/pr.2013.208>
- 10 Christensen RD, Lambert DK, Henry E, Eggert LD, Yaish HM, *et al.*, Unexplained extreme hyperbilirubinemia among neonates in a multihospital healthcare system, *Blood Cells Mol Dis*, 50 (2013) 105-109. <http://dx.doi.org/10.1016/j.bcmd.2012.10.004>
- 11 Wood B, Culley PH, Roginski CL, Powell JE & Waterhouse JO, Factors affecting neonatal jaundice, *Arch Dis Child*, 54 (1979) 111-115. <http://dx.doi.org/10.1136/adc.54.2.111>
- 12 Maisels MJ, Neonatal jaundice, *Pediatr Rev*, 27 (2006) 443.
- 13 Huang MJ, Kua KE, Teng HC, Tang KS, Tang, *et al.*, Huang, Risk factors for severe hyperbilirubinemia in neonates, *Pediatr Res*, 56 (2004) 682-689.
- 14 Maisels MJ, Phototherapy, In: Neonatal jaundice, edited by Maisels MJ & Watchko JF, (Harwood Academic Publishers, Amsterdam), 2000, 177-203.
- 15 Jährig K, Jährig D & Meisel P, Phototherapy: treating neonatal jaundice with visible light, (Quintessence Verlags-GmbH, Munich), 1993.
- 16 Kopelman AE, Brown RS & Odell GB, The "bronze" baby syndrome: a complication of phototherapy, *J Pediatr*, 81(1972) 466-472. [http://dx.doi.org/10.1016/S0022-3476\(72\)80172-0](http://dx.doi.org/10.1016/S0022-3476(72)80172-0)
- 17 Rubaltelli FF, Jori G & Reddi E, Bronze baby syndrome: a new porphyrin-related disorder, *Pediatr Res*, (1983) 327-330. <http://dx.doi.org/10.1203/00006450-198305000-00004>
- 18 Mallon E, Wojnarowska F, Hope P & Elder G, Neonatal bullous eruption as a result of transient porphyria in a premature infant with hemolytic disease of the newborn, *J Am Acad Dermatol*, 33 (1995) 333-336. [http://dx.doi.org/10.1016/0190-9622\(95\)91428-5](http://dx.doi.org/10.1016/0190-9622(95)91428-5)
- 19 Paller AS, Eramo LR, Farrell EE, Millard DD, Honig PJ, *et al.*, Purpuric phototherapy-induced eruption in transfused neonates: relation to transient porphyria, *Pediatrics*, 100 (1997) 360-364.
- 20 Dollberg S, Atherton HD & Hoath SB, Effect of different phototherapy lights on incubator characteristics and dynamics under three modes of servocontrol, *Am J Perinatol*, 12 (1995) 55-60. <http://dx.doi.org/10.1055/s-2007-994402>
- 21 Maayan-Metzger A, Yosipovitch G, Hadad E & Sirota L, Transepidermal water loss and skin hydration in preterm infants during phototherapy, *Am J Perinatol*, 18 (2001) 393-396. <http://dx.doi.org/10.1055/s-2001-18698>
- 22 Jorjani Zakhira Khawrazmshahi SE, (Bonyad-e frahange, Iran), 1976, 14-26. [In Persian]
- 23 Abdin MZ & Abrol YP, Traditional systems of medicine, (Alpha Science Int'l Ltd, Oxford, UK), 2006, 174-186.
- 24 Azmi AA, Basic concepts of Unani Medicine: A critical study, (Jamia Hamdard, New Delhi, India), 1995, 432-510.
- 25 Roshandel HR, Ghadimi F & Roshandel RS, Developing and standardization of a structured questionnaire to determine the temperament (Mizaj) of individuals, *Indian J Tradit Knowle*, 15 (2016) 68-78.
- 26 Jabin F, Guiding tool in Unani Tibb for maintenance and preservation of health: A Review study, *Afr J Tradit Comple Altern Med*, 8 (2011) 140-143. <http://dx.doi.org/10.4314/ajtcam.v8i5S.7>
- 27 Ansari S, Siddiqui MA, Khan AA & Alam S, Concept of Jaundice in Greco-Arab Medicine, *Turkish Journal of Family Medicine & Primary Care [TJFMPC]*, 9 (2015) 135-136. <http://dx.doi.org/10.5455/tjfmpr.171847>
- 28 Nasir M, Role of Unani herbal medicine in the management of acute hepatitis (Warm Kabid Haad), *Res Rev: J Herbal Sci*, 4 (2015) 9-15.
- 29 Yoosefi Haruni & Yusef ibn M, Riaz al advia correction by Nazari Muhammad, Tehran, 1391, 187.
- 30 Khorshidifard M, Pishva N & Bonyadi F, Assessment of Knowledge, Attitude and Behavior of Mothers on neonatal jaundice in Kazeroon city in 2013M, *Nursing J Vulnerable (NJV)*, 2 (2015) 59-68. [in Persian]
- 31 Amirshaghghi A, Ghabili K, Mohammadali M & Kooshavar H, Neonatal Jaundice: knowledge and practice of Iranian mothers with icter newborns, *Pak J Biol Sci*, 11 (2008) 942-945.
- 32 Hosseini L, Experience of mothers of children with jaundice: A qualitative study, *Nurs Res*, 18(5) (2010) 72-66 .
- 33 Khoshdel A & Kheiri S, Effect of *shir-e-khesht* (billinaster drop) consumption by the neonates or their mothers on the neonatal icter, *J Sharekord Univ Med Sci*, 13(4) (2011) 67-73.[Persian]
- 34 Ogunfowora OB & Daniel OJ, Neonatal jaundice and its management: Knowledge, attitude and practice of community health workers in Nigeria, *BMC Public Health*, 6 (2006) 1. <http://dx.doi.org/10.1186/1471-2458-6-19>
- 35 Willis SK, Hannon PR & Scrimshaw SC, The impact of the maternal experience with a jaundiced newborn on the breastfeeding relationship, *J Family Pract*, 51 (2002) 465-472.
- 36 Sarici SU, Serdar MA, Korkmaz A, Erdem G, Oran O, *et al.*, Incidence, course, and prediction of hyperbilirubinemia in near-term and term newborns, *Pediatrics*, 113 (2004) 775-780.
- 37 Saber A, Ferdowsi S, Askari F & Farsi I, Epidemiology of pathological jaundice and its association with demographic

- factors in infants born in the 22 Bahman Hospital in Gonabad, 2011, *Razi J Med Sci*, 20 (2013) 42-48.
- 38 Kolawole SE, Obueh HO & Okandeji-Barry OR, Prevalence of neonatal jaundice in Eku Baptist Community Hospital in Delta State Nigeria, *J Public Health Epidemiol*, 8 (2016) 87-90. <http://dx.doi.org/10.5897/JPHE2015.0779>
- 39 Henny-Harry C & Trotman H, , Epidemiology of neonatal jaundice at the University Hospital of the West Indies, *West Indian Med J*, 61 (2012) 37-42.
- 40 Butte NF, Lopez-Alarcon MG & Garza C, Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life, 2002.
- 41 Jamshidi Manesh M, Oskouie F, Jouybary L & Sanagoo A, The process of women's decision making for selection of cesarean delivery, *Iran J Nursing*, 21 (2009) 55-67.
- 42 Bertini G, Dani C, Tronchin M & Rubaltelli FF, Is breastfeeding really favoring early neonatal jaundice?, *Pediatrics*, 107 (2001) 41.