



Effect of Breast Feeding in Occurrence of Juvenile Idiopathic Arthritis in Abha City, Saudi Arabia

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ABSTRACT

Background: Juvenile idiopathic arthritis (JIA) is a chronic inflammatory arthritis and could be diagnosed among children with arthritis who are less than 16 years old. **Objectives:** To investigate the feeding factors, such as breastfeeding, in relation to the risk of later development of JIA. **Methods:** A cross-sectional questionnaire based study that was conducted at the department of pediatrics, Abha Maternity and Children Hospital, Saudi Arabia. The study included all the patients that are diagnosed of JIA in Abha Maternity and Children Hospital from 12 June 2013 to 12 December 2017. **Results:** Breastfeeding or early feeding showed a significant association with the risk of JIA. The majority of mothers didn't try breastfeeding even after 24 hours. The majority of subjects planned to start giving their children baby formula (43.2%) before 6 weeks of age and 25.7% would start it between 4-6 months. **Conclusion:** other large sample size studies should be conducted to assess the actual effect of breastfeeding on the risk of JIA among children. Also, mothers should be encouraged to breastfeed their babies, especially during the first 4 months.

Keywords: Juvenile Idiopathic Arthritis, Breastfeeding, Children and formula feeding

INTRODUCTION

Juvenile idiopathic arthritis (JIA) is one of the most common chronic rheumatic diseases among kids. It is a group of chronic arthritis that is known by onset before the age of 16 years, the existence of inflammation of synovium in addition to synovial fluid for minimum 6 weeks [1]. It is known to be an autoimmune sickness, which results from an immune reaction. It is caused or produced by several elements including the environmental factors in a genetically susceptible individual. However, the mean reason that leads to that autoimmunity disorder is unidentified till now [2].

It is known that the immunological memory of the mothers is inherited to their infants through breast milk [3]. The breast milk contains a diversity of immune-modulating mixtures and components. Breastfeeding causes immunological impressing and the process of programming of the infant on breastfeeding is thought to be an unparalleled method to nourish the baby. Human breast milk has irreplaceable nutritional properties and has a broad-diversity of immunoprotective features which expand the baby's immature immune system. Babies who have formula fed program can be at greater risk of infections in comparison with common infants [4].

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommended that babies must be fully fed for at least the first six months after birth with breastfeeding and this period is supposed to be extended for up to the age of two years or more. In contrast, in the Middle Eastern region, only low number infants are exclusively breastfed for six months after birth as supposed, [5] and thereby this causes a weakness in the maturity of the immune system of those infants [6].

It is thought that breastfeeding can protect against the growth and the risk of JIA [7]. In contrast, some other studies [6] revealed that breastfeeding did not have any impact on JIA. A research from the UK recently displayed that breastfeeding has a great relationship with JIA's milder onset [7].

However, the new studies and case-control studies in a prospective birth cohort, tells us the extended period of breastfeeding (both total and exclusive) may defend against the growth of JIA.

Other thoughts see that females should be stimulated to breastfeed their infants exclusively for 4 months and continue partial breastfeeding for longer periods when presenting foreign proteins [8]. Thus this main goal of this research is to investigate the feeding factors, such as breastfeeding, in relation to the risk of later development of JIA. Better experience and information about the impact of early feeding methods on the child. Also, the comparison between various kind of formula and its association with autoimmunity is of great importance for public health, as nutritional recommendations can aid to stop these chronic diseases.

PATIENTS AND METHODS

Study Design

This study is a cross-sectional questionnaire-based study that was conducted at the department of pediatrics, Abha Maternity and Children Hospital, Saudi Arabia. The study included all the patients that are diagnosed with JIA in Abha Maternity and Children Hospital from 12 June 2013 to 6 December 2017. The inclusion criteria were patients affected by juvenile chronic arthritis, born in Aseer with available contact address and diagnosed with persistent and extended JIA whereas excluded those who did not respond. The minimum sample size was calculated according to the formula of Swinscow and Cohen. The data of the patients were collected and a questionnaire was developed based on the relevant literature by Dr. Manal Dashti, and by a slight modification to meet the needs of this study population [9]. The required official approvals were provided from the supervisors, the ethical board of the hospital and respondents. Statistical Package for Social Sciences (SPSS) software version 18.0 was used for data entry and analysis. Descriptive statistics were presented as numbers and percentages for the categorical of data and mean and standard deviation for continuous data.

RESULTS

The study was conducted in Abha Maternity and Children Hospital, Saudi Arabia on 74 children suffering from Juvenile Idiopathic Arthritis (JIA). The maternal age ranged from 23-55 years with a mean of 35.87 ± 7.15 years. The children age ranged from 1-18 years, with a mean of 7.77 ± 3.28 years, the male represents 47.3%, while the females were 52.8%. The main type of JIA was oligoarthritic (40.0%), followed by polyarthritis whether +ve or -ve RF, 6 case was systemic onset and 12 cases (16.2%) was undifferentiated JRA. The age of onset of the disease shows the most frequent age of onset was 51.4%, while 22 cases less than 6 years, and 14 cases (18.9%) was more than 10 years.

Table 1 shows the distribution of the studied group regarding the breastfeed and formula feeds data.

Table 1 Distribution of the studied group regarding the breastfeed and formula feeds data

	Number	Percent
When did you first try to breastfeed?		
Within the first hour of birth	8	10.8
Between 1-3 hours after the birth	6	8.1
Between 3-6 hours after the birth	12	16.2
Between 6-24 hours after the birth	14	18.9
After one day from the birth	3	4.1
Not applicable	31	41.9
At what age of the baby do you plan to stop breastfeeding your baby?		
During the 1st month.	12	16.2
During the second month	2	2.7
Between 2 and 4 months.	6	8.1
Between 4 and 6 months.	4	5.4
Between 6 and 9 months	3	4.1
Between 9 and 12 months	4	5.4

Between 12 and 18 months	3	4.1
Between 18 and 24 months.	2	2.7
Over 24 months	6	8.1
Don't know yet	1	1.4
Not applicable	31	41.9
At what age of the baby do you plan to start giving your baby formula-feeds?		
Before 6 weeks.	32	43.2
Between 6 weeks and 2 months	3	4.1
Between 2 and 3 months.	11	14.9
Between 4 and 6 months	19	25.7
Between 7 and 9 months	1	1.4
Between 9 and 12 months	0	0
Over 12 months	5	6.8
Not applicable	3	4.1

Table 2 shows the distribution of the studied mothers regarding their clinical history and medical history, only one mother was smoking before pregnancy, regarding taking folic acid, 77.0% of the mothers take folic acid whether before, during and after pregnancy, 23.0% of cases don't take folic acid. 29.7% of children had health problems either since the birth or as a result of the birth. No cases received any medication during their pregnancy or before from chronic disease either since the birth or as a result of the birth. Only 14 cases (18.9%) had a family history of RA or JIA.

Table 2 Distribution of the studied mothers regarding their clinical history and medical history

	Number	Percent
Before you became pregnant did you smoke cigarettes?		
Yes	1	1.4
No	73	98.6
Did you take folic acid supplements during your pregnancy?		
Yes, before and during my pregnancy	24	32.4
Yes, as soon as I knew I was pregnant	33	44.6
No	17	23
Has your baby had any health problems, either since the birth or as a result of the birth?		
Yes	22	29.7
No	52	70.3
Did you receive any medication during your pregnancy or before from chronic disease?		
Yes	0	0
No	74	100
Do you have a family history of RA or JIA		
Yes	14	18.9
No	60	81.1

Table 3 shows the distribution of the studied mothers regarding their clinical history and medical data of children. All cases as complete their vaccination up to date. No cases had an infection when they were born.

As shown in our previously published study about the pattern of JIA among children in our hospital, the main type of JIA was oligoarthritic (40.0%), followed by polyarthritis whether +ve or -ve RF, 6 case was systemic onset and 12 cases (16.2%) was undifferentiated JRA. The age of onset of the disease shows the most frequent age of onset was 51.4%, while 22 cases less than 6 years, and 14 cases (18.9%) was more than 10 years. The most common symptoms appear of JIA, the most common symptoms were joint pain (86.5%), followed by swelling (37.8%), fever (33.8%), rash (24.3%), joint disability (20.3%), joint disability (20.3%) fatigue (16.2%), sleep disturbance (12.2%) and other symptoms appear in small number of patient. Table 4 shows the relation between the type of JRA and first try to breastfeed, it was found that there was no significant relationship between the type of JRA and the first try to breastfeed, ($p < 0.05$).

Table 3 Distribution of the studied mothers regarding their clinical history and medical data of children

	Number	Percent
Did your child complete his/her vaccination up to date?		
Yes	74	100
No	0	0
Did your child get an infection when he/she was born?		
Yes	0	0
No	74	100

Table 4 Relation between the type of JRA and first try to breastfeed

		Group					Total
		Oligoarthritic	Polyarthrititis	Systemic onset	Arthritis	undifferentiated JRA	
Not applicable	No.	0	2	0	0	0	2
	%	0	0.083	0	0	0	0.027
Within the first hour of birth	No.	6	1	0	1	6	14
	%	0.2	0.042	0	0.5	0.5	0.189
Between 1-3 hours after the birth	No.	4	4	1	0	0	9
	%	0.133	0.167	0.167	0	0	0.122
Between 3-6 hours after the birth	No.	10	6	0	1	1	18
	%	0.333	0.25	0	0.5	0.083	0.243
Between 6-24 hours after the birth	No.	8	9	5	0	4	26
	%	0.267	0.375	0.833	0	0.333	0.351
After one day from the birth	No.	2	2	0	0	1	5
	%	0.067	0.083	0	0	0.083	0.068
Total	No.	30	24	6	2	12	74
	%	1	1	1	1	1	1
X ²		26.8					
p		0.14					

Table 5 shows the relation between type of JRA and the age of the baby when planned to stop breastfeeding the baby, it was found that there was a significant relationship between the type of JRA and age of the baby when planned to stop breastfeeding the baby, the majority of Oligoarthritic was in the period 1-6 months ($p < 0.05$)

Table 6 shows the relation between the type of JRA and age of the baby when planned to start giving your baby formula-feeds, it was found that there was no significant relation between JRA and age of the baby when planned to start giving the baby formula-feeds ($p > 0.05$).

Table 5 Relation between the type of JRA and age of the baby when planned to stop breastfeeding

		Group					Total
		Oligoarthritic	Polyarthrititis	Systemic onset	Arthritis	undifferentiated JRA	
Not applicable	No.	0	2	0	0	0	2
	%	0	0.083	0	0	0	0.027
During the 1st month.	No.	10	6	0	0	1	17
	%	0.333	0.25	0	0	0.083	0.23
During the second month	No.	1	1	0	1	0	3
	%	0.033	0.042	0	0.5	0	0.041
Between 2 and 4 months.	No.	5	3	0	0	2	10
	%	0.167	0.125	0	0	0.167	0.135
Between 4 and 6 months.	No.	1	4	1	0	1	7
	%	0.033	0.167	0.167	0	0.083	0.095
Between 6 and 9 months	No.	5	0	1	0	1	7
	%	0.167	0	0.167	0	0.083	0.095

Between 9 and 12 months	No.	2	4	0	0	2	8
	%	0.067	0.167	0	0	0.167	0.108
Between 12 and 18 months	No.	3	2	0	0	2	7
	%	0.1	0.083	0	0	0.167	0.095
Between 18 and 24 months.	No.	1	0	0	1	0	2
	%	0.033	0	0	0.5	0	0.027
Over 24 months	No.	2	2	4	0	2	10
	%	0.067	0.083	0.667	0	0.167	0.135
Don't know yet	No.	0	0	0	0	1	1
	%	0	0	0	0	0.083	0.014
Total	No.	30	24	6	2	12	74
	%	1	1	1	1	1	1
X ²	69.9						
p	0.002*						

Table 6 Relation between the type of JRA and age of the baby when planned to start giving formula-feeds

		Group					Total
		Oligoarthritic	Polyarthritits	Systemic onset	Arthritis	undifferentiated JRA	
Before 6 weeks	No.	0	2	0	0	1	3
	%	0	0.083	0	0	0.083	0.041
Between 6 weeks and 2 months	No.	18	7	1	1	5	32
	%	0.6	0.292	0.167	0.5	0.417	0.432
Between 2 and 3 months	No.	2	1	0	0	0	3
	%	0.067	0.042	0	0	0	0.041
Between 4 and 6 months	No.	4	4	1	0	2	11
	%	0.133	0.167	0.167	0	0.167	0.149
Between 7 and 9 months	No.	5	7	4	0	3	19
	%	0.167	0.292	0.667	0	0.25	0.257
Between 9 and 12 months	No.	0	1	0	0	0	1
	%	0	0.042	0	0	0	0.014
Over 12 months	No.	1	2	0	1	1	5
	%	0.033	0.083	0	0.5	0.083	0.068
Total	No.	30	24	6	2	12	74
	%	1	1	1	1	1	1
X ²	23.1						
p	0.051						

DISCUSSION

This study showed that the bottle feeding or early feeding showed a significant association with the risk of JIA. This study also has some limitations including it is a questionnaire-based study but not a case-controlled study to compare the effect of breast or early feeding on the risk of JIA among healthy and diseased subjects. Another limitation is that the number of the study population is low and don't represent the whole JIA patients.

Consistent studies showed a significant association between breastfeeding and the risk of JIA [10-12].

Some strength factors are found in this study as it is the first study in KSA studying the effect of breastfeeding and feeding formula on the risk of JIA and studying its association with different categories of JIA [13].

The majority of mothers tried breastfeeding between 6-24 hours after birth among 35.1%, 24.3% started breastfeeding after 3-6 hours and 14.9% fed their children within the first hour. The majority of subjects planned to start giving their children baby formula (43.2%) before 6 weeks of age and 25.7% would start it between 4-6 months. Also, most of the mother stopped breastfeeding. However, the average breastfeeding duration was the same as many studies conducted around the world [14-16]. Another contrast study showed that the current national recommendations

supposed that 85% of infants were breastfed until 4 months of age and more than 90% were introduced to solid food during the recommended 4 to 6 months [14].

CONCLUSION

There was a significant correlation between the JIA and bottle feeding or early feeding. However, other large sample size studies should be conducted to assess the actual effect of breastfeeding on the risk of JIA among children. Also, mothers should be encouraged to breastfeed their babies, especially during the first 4 months.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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