ORIGINAL ARTICLE

PREVALENCE AND RISK FACTORS FOR INFANTILE COLIC IN DISTRICT MANSEHRA

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Objective: Infantile colic is a common problem among infants age 3 days to 3 months. It may affect parental feelings negatively and the parents may undertake all kinds of actions to stop excessive crying. The objective of this study was to assess the incidence of infantile colic and its risk factors in infants born in District Mansehra. **Methods:** In this prospective study, all those newborn babies were included who were born at King Abdullah Teaching Hospital Mansehra between January 1st 2008 and March 31, 2008, and those newborn babies who were brought to children OPD for routine check-up and EPI centre for vaccination of this hospital during this time period. For every infant, gender, mode of delivery, gestational age at birth, birth weight, birth order, and mother's reproductive history were collected. These babies were seen at least once in a week up to 12 weeks and history from the mothers about the duration of crying and fussiness behaviour was recorded. At the end of 3 months the infants were again assessed and additional information on infant nutritional source was obtained and any medication used for colic relief was identified. Cases of colic were identified by applying Wessel criteria to recorded data. Chi-square tests were used. **Results:** From total 512 infants, follow-up was completed for 426 infants. In total, 90 infants (21.77%) satisfied the Wessel criteria for infantile colic. No statistical significance was found between colicky and non-colicky infants according to sex, gestational age at birth, birth weight, type of delivery, and, infant's feeding pattern. However, firstborn infants had higher rate for developing colic (p=0.03). **Conclusion:** Prevalence of colic was 21.77% in this infant population of District Mansehra. Except for birth order, no other variable was significantly associated with infantile colic.

Keywords: Infantile colic, Prevalence, Risk factors

INTRODUCTION

Infantile colic refers to a behavioural syndrome occurring during the first 3 months of life.[1] Excessive crying of a young infants is common and often a serious problem for parents.[2–4] As such it may affect parental feelings negatively and may cause to be regarded as vulnerable or difficult baby.[2,3,5,6] Parents may under take all kind of actions to stop excessive crying. Some of these actions may come in child abuse and may be very dangerous to the infant's health[2,3,7] such as slapping or shaking the child. Despite its potentially substantial negative health consequences no consensus has been reached on the definition of excessive crying often called, 'infantile colic'. By far the most widely used quantitative definition of colic is the one proposed by Wessel *et al* known as the 'rule of threes'.[1,8]

Infants are considered to have colic if they cry for more than 3 hour a day, for more than 3 days a week, and for more than 3 weeks. It is usually self-limiting, without long term adverse consequences, but as said earlier can be distressing and frustrating for parents. Estimates of cumulative incidence have varied from 10–40%.[1,9,10] This wide range may reflect differences in definitions, methods of data gathering, and study design[9,11] but also it may be related to a true difference in the occurrence rate of infantile colic among different communities. A few studies provide prevalence rate based on several definitions[12,13] but only one shows the degree to which various definition comprise the same children.[12]

The aim of this study was an effort to contribute new data from Pakistan as well as to identify risk factors for developing infantile colic.

MATERIAL AND METHODS

This prospective study was performed at King Abdullah Teaching Hospital Mansehra, from January 1 to March 31, 2008. All babies, who were born in this hospital and those who were brought to paediatrics unit for routine check-up, and those who came to EPI centre for vaccination during this time period, were included. Age limits were from birth to 3 months.

Upon agreement to enter to the study, data for every infant like gender, type of delivery, gestational age at birth, birth weight, birth order, and mother's reproductive history were collected by direct interview with the mother or their attendants. The mothers were interviewed once in a week about the crying and fussiness behavior. Crying due to other causes like hunger, fatigue or diaper changing were excluded. Cases of colic were identified by applying Wessel criteria to recorded data. We excluded those cases that did not come for follow up due to diseases of mother and baby or death of the baby. The statistical analysis was performed using SPSS-11. Chi-square was used for comparison of proportions, and $p \leq 0.05$ was considered significant.

RESULTS

A total of 512 infants were included in the study but 81 infants were excluded because their mothers were not able to come by one reason or the other. As a result 431 babies were initially entered to this study. Of these 431 babies another 5 babies were excluded, because of death of babies or they have not come for follow up. So 426 babies were completely followed up for three months. The rate of overall drop-out after enrolling to the study was 22%. Subsequent analyses were performed on these 426 infants who completed the study protocol. The results are presented in Table-1.

Table-1: Comparison of risk factors among colicky and non colicky group

Factor	Colicky group (n=90)	Non-colicky group (n=336)	*p*
Gender			
Male	45	180	0.40
Female	45	156	
Mode of delivery			
Vaginal	58	204	0.58
Cesarean	32	132	
Gestational age at birth			
>37 wk	62	251	0.38
<37 wk	28	85	
Birth weight			
>2500 g	69	280	0.21
<2500 g	21	56	
Birth order			
First born	58	167	0.03
Later born	32	169	
Mode of feeding			
Exclusive breastfed	69	269	0.24
Non-exclusive breastfed	21	67	

Out of 426 infants, 225 (52.8%) were male and 201 (47.2%) were female. The range of birth orders was from 1–7 with the most frequent one was the first order which comprised 225 infants (52.8%). According to gestational age at birth, 305 infants (71.59%) were born full-term, 113 (26.59%) pre-term and 8 (1.87%) post-term. Type of delivery was vaginal delivery in 273 cases (64.2%) and caesarean section in 153 cases (35.8%). The Mean±SD of birth weights was 3,072±580 g (range: 1,200–5,000 g). In total, 75 infants (17.6%) had a low birth weight (<2,500 g). By 2 month of age, the frequencies of exclusive breast-fed, exclusive formula-fed, and complementary-fed infants were 354 (83.09%), 30 (7.04%), and 42 (9.85%), respectively. In total 90 infants fulfilled the Wessel criteria for infantile colic all had cry fuss behavior of at least 3 hours a day, on 3 days per week lasting for 3 weeks or more. No infant met the Wessel medication sub criteria, i.e., their symptoms resolved after one week by taking medication. Overall the prevalence was about 21.77% in this study. The frequency of selected potential risk factors for infantile colic in colicky and non-colicky subgroups has been demonstrated in Table-1. Being fist born infant was more probable in colicky population p=0.03. But no significant difference for others variables including gender, mode of delivery, gestational age at birth, birth weight mode of feeding was found between 2 sub-groups.

DISCUSSION

The prevalence of colic in the first 3 month of infancy was 21.77% in this study. This rate is in accordance with most reports from developing and developed countries.[1,8] In one study colic affects 5% to 25% of infants throughout the world.[9,14] It has been suggested that vast majority of infants with colic are presented by age of 6 week. At 6wk of life the infants are expected to have most cases of colic's, as it is considered to be the peak age of cry and fuss.

Colic is widely believed to remit by 3 month of age.[1,2] Therefore it would be improbable that we missed significant number of colic's by following the infants for 90 days.

We defined the occurrence of colic using the criteria proposed by Wessel, which are the criteria for diagnosis of colic in infants, which has gained most acceptances.[11,15,16] The popularity of colic definition in this study would make our results more comparable with the counterpart studies from Iran and western societies. The reported occurrence rates of infantile colic vary within a wide range, i.e., from 5–30%.[17,18] In some other studies it was between 35–40%.[19,20] The difference in incidence rate may be variation in definition of colic and difference in study design and method of data collection and population size.[9,14] Different diet and care taking activities both of potential relevance to colic incidence[1,3] between developed and developing countries make comparative studies more plausible. Two retrospective studies published from India and Brazil revealed colic prevalence of 16% and 16.3%, respectively.[21,22] In a prospective study of 160 Korean infants, no case of infantile colic was found.[23]

The only variable showed to be predictive of colic development in this study was the birth order. Other factors including gender, weight at birth, and type of delivery, mode of feeding and prematurity were not associated with the development of colic.

Our study showing no difference regarding gender for colic presentation is in accordance with most other reports.[7,9] In a systematic review only one study reported a significantly higher proportion of boys crying more than 3 hour per day.[7,9] Mode of delivery was not associated with colic in our study, which is in agreement with a report by Hogdall *et al*[24] Like our study, no association between colic and low birth weight found in Lucassen's review.[9] That is contradicting with Crowcroft's study.[2]

There was no protective role of exclusive breastfeeding on the development of colic in our study. Among surveys compared breast fed and formula fed

infants: three found no difference.[7,25,26] In two studies the occurrence rates among breast fed infants[2,27] were slightly higher, and in one it was slightly lower.[7]

Being first borne was the single predicting factor for colic in our study. Surprisingly, this association has been evaluated in very few studies. Crowcroft *et al* published similar result but Lucassen *et al* and Saavedra *et al* reported contradicting finding.[9,27]

To evaluate the prevalence and risk factors of infantile colic, we took the primary advantage of cohort studies for being not susceptible to reverse causality distortions. The prospective design of the study yields more reliable estimates of occurrence rates than retrospective studies, as the latter are prone to recall bias.

Our study had two main limitations. Firstly, this was a single-centre study and accordingly prone to selection bias distorting the application of the results to the reference community. Admittedly, because of differences in referral pattern in community and private hospitals, we cannot exclude this potential source for selection bias. Secondly, we lost 22% of cases initially enrolled to the study. This may raise the possibility of selection bias in the results. Higher rates for drop-out, however, are usual in other prospective studies.

CONCLUSION

The prevalence for colic was defined 21.77% in the study group. The only significant predictor for developing colic was being the first live-born infant. The possible contribution of cultural, nutritional, and socio-economical factors to colic development make it prudent to conduct more studies in developing countries.

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