

## Prevalence and Risk Factors for Infantile Colic in Egyptian Infants

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**Abstract:** *Infantile colic* is a syndrome characterized by paroxysms of irritability, inconsolable crying, and screaming accompanied by clenched fists, drawn-up legs, and a red face. The most commonly accepted, but not necessarily most commonly used, diagnostic criteria are based on the “rule of threes” proposed by Wessel, which requires the syndrome to persist for  $\geq 3$  hours per day,  $\geq 3$  days per week, and  $\geq 3$  weeks. **Aim of this work:** is to assess the incidence of infantile colic and its risk factors in Egyptian infants. **Methods:** In this prospective study, 540 infants, aged 3-16 weeks attending a primary health care office in Sharkia, were included and reviewed for the presence and risk factors for infantile colic. Cases of colic were identified by applying Wessel criteria to recorded data. **Results:** From total 540 infants, 200 infants were found to fulfill Wessel criteria (37%). No statistical significance was found between colicky and non-colicky infants according to sex, type of delivery, infant’s feeding pattern, household smoking and parental and or maternal headache. **Conclusion:** Prevalence of colic was 37% in this infant population of Sharkia government. No risk factors found significant for infantile colic in the studied group.

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### 1. Introduction

Colic is one of the common reasons parents seek medical advice for their baby in his first 3–4 months of life. Those most affected by colic are the parents. Sleepless nights and the inability to console a newly arrived baby cause a great deal of stress, especially among first-time parents.(1). Mothers of infants with colic were found to be more concerned about their infants’ temperament and even to feel rejection compared with mothers of infants without colic.(2)

Infantile colic is a behavioral syndrome characterized by excessive paroxysmal crying, that is most likely to occur in the evenings without any identifiable cause. There are so many definitions but the most widely used one is based on the amount of crying by Wessel *et al.* which states that it is paroxysms of excessive crying in an otherwise healthy baby lasting more than 3 hours per day, occurring more than 3 days in any week for 3 weeks, aged 2 weeks to 4 months.(3)

Estimates of cumulative incidence have varied from 10 % to 40% (4&5). This wide range may reflect differences in definitions, methods of data gathering, and study design [6], but also it may be related to a true difference in the occurrence rate of infantile colic among different communities(7). Notably, most studies are from western societies and many reviews only use data from selected populations (4&8). While, due to the possible contribution of psychosocial factors to colic incidence(9), it is unclear whether the data from developed countries can be applied to others, there are

scarce reports on colic incidence and its risk factors from developing countries(10) especially Egypt.

The cause of infantile colic remains unclear. Underlying organic causes of excessive crying must be considered during the evaluation. Organic causes account for less than 5 percent of infants presenting with excessive crying(11). These includes CNS causes like infantile migraine and subdural haematoma, GIT causes include constipation, cow’s milk protein intolerance, gastro esophageal reflux, lactose intolerance, intussusception, rectal fissure, strangulated inguinal hernia. Infections like meningitis, otitis media, urinary tract infection and viral illness can also mimic colic. Trauma has to be excluded in a colicky baby namely child abuse, corneal abrasions, foreign body in the eye, fractured bone and hair tourniquet syndrome (12&13).

Gastrointestinal, psychosocial, and neurodevelopmental disorders have been suggested as the cause of colic (14).

Gastrointestinal disorders have been implicated in colic because of the infant’s leg position and grimacing during a crying spell. Excessive crying or increased gas production from colon function can result in intraluminal gas formation and aerophagia. This mechanism does not appear to be the cause of colic, however, because radiographic images taken during a crying episode have shown a normal gastric outline (15). Gut hormones such as motilin also may play a causative role in colic. Motilin is thought to cause hyperperistalsis, leading to abdominal pain and colic (14).

Although studies have addressed possible psychosocial causes of colic, no evidence has been found in support of this mechanism. Even when colicky infants are cared for by trained occupational therapists, they cry twice as long as infants without colic. The hypothesis that colic is an early manifestation of a difficult temperament is not supported by prospective longitudinal studies (16).

A wide variety of risk factors have been proposed as being linked with an increased risk of colic. For example, a large community study in Sheffield found that the incidence of colic was higher with increasing parental age and years in full time education, lower parity, and more affluent homes and districts of residence (17). A systematic review of community based surveys found no overall association with gender, socio-economic class, type of feeding, or family history of atopy. Household smoking, mother diet, headache, being 1st born was reported as risk factors in many studies. These 'risk factors' may be affected by reporting bias, and researchers often admit that they cannot explain why a particular factor would increase the incidence of colic (5&10)

**The aim of this study** is to assess the prevalence of infantile colic and its risk factors in Egyptian infants.

## 2. Material, Subjects and Methods

This prospective study was conducted at a primary health care office in Sharkia from January to September 2012. Permission was taken from the local authority and from parents before beginning of this study. All babies coming for registration and routine vaccination during this time period, were included in the study.

Age limits were from birth to 4 months. Upon agreement to enter 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. Full history taking and thorough medical examination was done for all infants enrolled in the study.

The mothers were interviewed once every 2 weeks about the crying and fussiness behavior. Crying due to other causes like hunger, diaper changing and any organic causes 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 or died.

Statistical analysis was performed using SPSS version 15 software. Data were expressed as mean  $\pm$  standard deviation or median (range) for quantitative data, and number and percent for qualitative data. Analysis of quantitative data for significant differences was determined by comparing means using student's test and analysis of qualitative data was compared using chi-square test. A *p* value of  $< 0.05$  was considered significant.

## 3. Results

Table (1) presents the demographic data of the studied groups. This study included 540 infants with age range from 3-16 weeks in the control group and 4-16 weeks in the cases group. The incidence of infantile colic in this study was found to be 37 %.

Although we founded increased incidence of infantile colic in male infants (62%) than female infants (38%), yet this increase was statistically insignificant (Table 2). As regard the mode of delivery, we founded no significant association between infantile colic and mode of delivery (Table 3).

Table 4 presented the relation between birth order and prevalence of infantile colic. Although infantile colic found to be increased in 1<sup>st</sup> born (62.5%) than later born (37.5%), yet this increase was statistically insignificant ( $P > 0.05$ ). No significant association was found between the prevalence of infantile colic and type of feeding ( $P = 0.87$ ) as shown in table 5.

Table 6 & Table 7 presented the relation between infantile colic and household smoking and parental & maternal headache. No significant association were founded between household smoking and paternal & maternal headache and infantile colic ( $P = 0.26$  &  $0.05$  respectively).

Table 1: Demographic Data of Studied Groups :

	Non-colicky group (n=340)	Colicky group (n=200)	Test of significance	<i>P</i>
Age (Weeks)				
Range	3-16	4-16	t	
Mean $\pm$ SD	7.5 $\pm$ 2.5	7.8 $\pm$ 2.4	1.367	(NS)
Gender			X <sup>2</sup>	
Males	185(54.4%)	124(62%)		
Females	155(45.6%)	76(38%)	2.669	(NS)

Table 2 : Relation of infantile colic to infants gender:

Gender	Non-colicky group (340)		Colicky group (200)		X <sup>2</sup>	<i>P</i>
	No	%	No	%		
Male	185	54.4	124	62		0.555
Female	155	45.6	76	38	0.348	(NS)

Table 3 : Relation of infantile colic to the mode of delivery:

Mode of Delivery	Non-colicky group (340)		Colicky group (200)		X <sup>2</sup>	P
	No	%	No	%		
NVD	119	35	85	42.5	0.302	0.582 (NS)
C.S	221	65	115	57.5		

Table 4 : The effect of birth order on the prevalence of infantile colic:

Birth Order	Non-colicky group (340)		Colicky group (200)		X <sup>2</sup>	P
	No	%	No	%		
First born	170	50	125	62.5	1.06	0.303 (NS)
Later born	170	50	75	37.5		

Table 5 : Type of feeding and its relation to infantile colic:

Feeding	Non-colicky group (340)		Colicky group (200)		X <sup>2</sup>	P
	No	%	No	%		
Exclusive breast fed	264	77.6	162	81	0.015	0.87 (NS)
Non-exclusive breast fed	76	22.4	38	19		

Table 6 : Relation between household smoking and the incidence of infantile colic:

Household Smoking	Non-colicky group (340)		Colicky group (200)		X <sup>2</sup>	P
	No	%	No	%		
Positive	155	45.6	65	32.5	1.260	0.26 (NS)
Negative	185	54.4	135	67.5		

Table 7 : Paternal and maternal headache and infantile colic risk:

Headache	Non-colicky group (340)		Colicky group (200)		X <sup>2</sup>	P
	No	%	No	%		
Positive	115	33.8	110	55	3.826	0.05 (NS)
Negative	225	66.2	90	45		

#### 4. Discussion

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 prevalence of infantile colic in this study was 37 % in this study. This rate is in accordance with most reports from developing and developed countries (5&11).

The reported occurrence rates of infantile colic vary within a wide range, i.e., from 5–30 % (18&19). In some other studies it was between 35–40 % (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 (4).

Our study showing no difference regarding gender for colic presentation is in accordance with most other studies. In a systematic review only one study reported a significantly higher proportion of males crying more than females (10).

Mode of delivery was not associated with colic in our study, which is in agreement with a report by Hogdall *et al.* (21) and Fazil (10).

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 (22&23). In two studies the occurrence rates among breast fed infants were slightly higher (6&24), and in one it was slightly lower (25).

We found no significant association between infantile colic and household smoking. Many studies have investigated the link between household smoking and infantile colic, but infantile colic was defined according to Wessel's rule of threes (crying for  $\geq 3$  hours per day,  $\geq 3$  days per week, for  $\geq 3$  weeks) in only few of these studies. The remaining studies used definitions that ranged from less-stringent variations of Wessel's criteria to definitions that would suggest excessive crying but not necessarily colic. Results from 6 of these studies suggest that there is an independent association between maternal smoking and excessive crying, as well as infantile colic. Recent studies of the GI system provide strong, but indirect, corroborating evidence suggesting physiologic pathways through which maternal smoking can be linked to infantile colic. This physiologic evidence can be outlined as follows: (1) smoking is linked to increased plasma and intestinal motilin levels and (2) higher-than-average

levels of motilin are linked to elevated risks of infantile colic (26).

In our study, no significant association was found between paternal and or maternal headache and infantile colic. In contrast, Gelfand *et al.* (27) in their study of data from 154 infant-mother pairs. Infants with a maternal history of migraine were 2.6 times as likely to have colic as infants without a maternal history of migraine (29% vs 11%, prevalence ratio 2.6 (95% confidence interval 1.2-5.5),  $p = 0.02$ ). There was no difference in the accuracy with which migraineur mothers perceived their infants' colic status compared with that of nonmigraineur mothers. Data on paternal history of migraine were available for 93 infants. Infants with a paternal history of migraine may have a higher prevalence of colic (22% vs 10%), although the prevalence ratio 2.3 (0.6-9.4,  $p = 0.24$ ) had wide confidence intervals. In contrast to Gelfand study, we asked about history of paternal and maternal headache and not migraine in our study and this may explain the difference.

### Conclusions and recommendations

Prevalence of infantile colic was 37% in this infant population of Sharkia government. No risk factors found significant for infantile colic in the studied group. A wider study, included a big number of infants and covering a different area, is recommended for recognition for the prevalence and the risk factors for infantile colic in Egypt.

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