

Original Research Article

A cross sectional survey in paediatricians pertaining to management of functional gastrointestinal disorders in infants: Indian perspectives

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ABSTRACT

Background: Functional gastrointestinal disorders (FGIDs) in infants and toddlers possess extensive burden to the parents and healthcare professionals. Guidelines addressing the practices in diagnosis and management of FGIDs in infants in Indian subcontinent is unavailable. Hence this study assessed current knowledge, attitude and practice of pediatricians in diagnosis and treatment of FGIDs.

Methods: A cross-sectional survey based on a structured questionnaire assessed pediatrician's knowledge about prevalence and profile of most common GI disorders in pediatric age groups (birth to 12 months), association of FGIDs with different feeding practices, impact of FGID on quality of life, various management options and physician preferred method of treatment.

Results: Colic was rated as the most common GI disorder, followed by gassiness/fussiness, regurgitation and constipation. About 59% pediatricians come across FGIDs more in formula-fed infants compared to breastfed infants (4.2%) and 93.9% pediatricians affirm that FGIDs affect quality of life. Approximately 91% pediatricians believed reassurance and education was the best management option, which was also reported as the preferred mode of management by about 89% pediatricians, whereas pharmacological therapies were the least preferred (1.6%). For breastfed infants suffering with regurgitation, colic or constipation, majority pediatricians opted for switching to 100% whey partially hydrolysed protein formula; sequentially followed by use of pre/probiotics and switch to extensively hydrolyzed protein formula.

Conclusions: Parental education and reassurance offer an ideal mode of management of FGIDs. Partially hydrolysed protein formula may be considered one of the best management options irrespective of the FGID condition in infants who are breastfed.

Keywords: Breastfeed, Functional gastrointestinal disorders, Infants, Paediatricians, Partially hydrolysed protein formula, Quality of life

INTRODUCTION

Functional gastrointestinal disorders (FGIDs) in infants and toddlers are common worldwide and cover a variety of disorders associated with chronic, recurrent symptoms attributable to the gastrointestinal tract, but not explained by structural or biochemical abnormalities.¹ Right from birth to 6 months of age, approximately one infant out of

two shows at least one FGID or related signs and symptoms. Regurgitation, infantile colic and functional constipation are the most common FGIDs in infancy, and it has been shown that more than one FGID often coexist in the same infant.² FGID diagnosis becomes a challenge as it depends on parental reports and interpretations of their child's symptoms. Also, parents receive conflicting advice and medications related to symptom management,

ranging from personal experience, to expert opinions and evidence-based guidelines.² These issues create psychological stress on parents and healthcare providers leading to a never-ending cycle of trying medications, dietary manipulations, behavioral strategies and complementary supplements.³ This in turn have a significant impact on personal and public healthcare expenses, which include the costs of prescribed treatments in countries where residents pay for child healthcare, over the counter or home remedies, visits to healthcare professionals and loss of income when parents have to take time off work.² In Asian infants, the studies on epidemiology, etiology and management of FGIDs are scarce and mostly extend the understanding from global research. At a recent workshop and literature review, a group of health care professionals from China, Indonesia, Malaysia, Singapore, Thailand, Hong Kong, and India had reviewed the available data for their respective countries. Based on a systematic literature search it was concluded that data on the prevalence of FGIDs in Asia was scarce, with considerable variation depending on the applied criteria, study design, methodology, and/or study populations. Few countries have clear guidelines on the diagnosis and management of FGIDs, and dissemination and implementation are unclear.⁴

Therefore, this cross-sectional survey aimed to assess current knowledge, attitude and practice of pediatricians in diagnosis and treatment of FGIDs in infants in Indian settings.

METHODS

This is a cross-sectional survey conducted across India from March 2019 to June 2019, based on a structured questionnaire. Pediatricians who were practicing in community or private set up with at least 6 years of experience predominantly in the urban/semi-urban areas were included in the survey. All the participants were informed about the study purpose and informed consent was procured from all the respondents.

The paper-based survey questionnaire (for detailed questionnaire see additional file 1: Appendix) was developed by a group of pediatricians by performing extensive literature review. This group of pediatricians comprised of regional experts from different Indian states. The pretested survey administered in English language was structured into 13 multiple-choice questions that dealt with pediatrician's knowledge of prevalence, common symptoms; diagnostic procedures of FGIDs that assessed association of FGID with different feeding practices like breastfeeding or formula feeding, impact of FGID on quality of life; and lastly physician preferred management practices for common FGIDs encountered in feeding practices in infants of age 0 - 12 months, as outlined below.

Knowledge on FGID

It depends on number of cases of FGIDs seen by pediatricians, most common FGIDs in pediatrician practice, age of FGID occurrence in children, common FGID Symptoms in different age groups, association of FGID with different feeding practices.

Attitude on management of FGID

It depends on FGID and quality of life of infants and caregivers, FGID and reassurance and education of parents, best management option for most cases of FGID.

Practice preference for management of FGID

It depends on preferred mode of management of FGID, best option for nutritional management of baby suffering from regurgitation while on breastfeed, best option for nutritional management of baby suffering from colic while on breastfeed, best option for nutritional management of baby suffering from constipation while on breastfeed, preference of factors that help in deciding formula feed in FGIDs.

Statistical Analysis

The analysis for the study was performed using statistical package for social sciences (SPSS, IBM, USA). All the survey questions were categorical with multiple choice answer. A descriptive analysis of the data was performed. Outcomes assessed were epidemiology of FGIDs in pediatric population. Data were analysed estimating frequencies with percentages of each question. This study was approved by independent ethics committee. Convenience sampling was employed to collect data. Considering 99% confidence level and 5% as the margin error, the ideal sample size calculated was around 650. We contacted 1000 pediatricians out of which 785 agreed to participate in the study (response rate 78.5%).

RESULTS

Knowledge on FGID

Number of cases of FGIDs seen by pediatricians

The survey questioned pediatricians regarding their knowledge about FGID cases and common symptoms in pediatric population less than 1 year of age. It revealed that 42.8% pediatricians see 3-5 cases and 38.6% see 1-2 cases of FGID out of every 10, whereas 18.6% see more than 5 FGID cases in daily practice.

Most common FGIDs in pediatrician practice

According to 39.5% pediatricians, colic was rated as 1st i.e. the most common GI disorder, followed by gassiness/fussiness as rated 2nd by 34.8% pediatricians, while 28.2% pediatricians rated regurgitation as 3rd most

common GI disorder and 45.2% rated constipation at the 4th position 9 (Table 1).

Table 1: Occurrence of common FGID conditions as per pediatricians and in different age groups.

Gastrointestinal issues	1 N (%)	2 N (%)	3 N (%)	4 N (%)
Regurgitation (n=752)	190 (25.3)	197 (26.2)	212 (28.2)	153 (20.3)
Colic (n=752)	297 (39.5)	186 (24.7)	221 (29.4)	48 (6.4)
Constipation (n=752)	146 (19.4)	146 (19.4)	120 (16.0)	340 (45.2)
Gassiness/fussiness (n=752)	138 (18.4)	262 (34.8)	222 (29.5)	130 (17.3)
Gastrointestinal issues	≤6 mth	-	>6 mth	-
Regurgitation (n=760)	736 (96.8)	-	24 (3.2)	-
Colic (n=760)	747 (98.3)	-	013 (1.7)	-
Constipation (n=760)	163 (21.4)	-	597 (78.6)	-
Gassiness/fussiness (n=760)	556 (73.2)	-	204 (26.8)	-

Age of FGID occurrence in children

When analysing the GI disorders in different age groups, we found that most pediatricians (98.3% and 96.8% respectively) believe colic and regurgitation are more common in the ≤6 months age group, whereas according to 73.2% pediatricians gassiness/fussiness was less common in this age group. In children of higher age group (>6 months), 78.6% pediatricians believe constipation to be the most common symptom. (Table 1)

Table 2: FGID symptoms as per pediatric age group in clinical practice.

Age groups (mth)	Regurgitation No. (%)	Colic No. (%)	Constipation No. (%)	Gassiness/Fussiness No. (%)
0-3 (n=228)	121 (53.1)	93 (40.8)	-	14 (6.1)
4-6 (n=228)	82 (36.0)	118 (51.8)	1 (0.4)	27 (11.8)
7-9 (n=228)	23 (10.1)	14 (6.1)	056 (24.6)	135 (59.2)
10-12 (n=228)	-	1 (0.4)	170 (74.6)	57 (25.0)

While analysing the outcomes of pediatrician’s clinical practices, it was observed that 53.1% and 40.8% pediatricians come across regurgitation and colic as the most common symptom in the 0-3 months age group respectively; while 51.8% reported colic as the most common symptom in 4-6 months age. Also, 59.2%

peditricians come across gassiness/fussiness as a predominant symptom in the 7-9 months old, while constipation is most commonly seen in the 10-12 months age group as reported by 74.6% pediatricians (Table 2).

Association of FGID with different feeding practices

While trying to understand the feeding practices in infants and their relation to FGIDs, majority (59.4%) of pediatricians commonly see FGIDs in formula fed infants, followed by 36.4% pediatricians observing FGIDs in infants who are given combination of breastmilk and formula feed. Whereas only 4.2% pediatricians reported FGID occurrence in exclusively breastfed infants.

Attitude on management of FGID

FGID & Quality of life of infants and caregivers

According to questions accessing impact on quality of life, majority of pediatricians (93.9%) affirm that FGIDs do impact quality of life of infants and caregivers.

FGID and reassurance and education of parents

Almost all pediatricians, 783 out of 785 (99.7%) agreed that reassurance and education of parents is important in management of FGIDs.

Best management option for most cases of FGID

When asked opinion about the best management option, 90.6% pediatricians believed that reassurance and education work the best, followed by 7.8% pediatricians opting for nutritional modification, while only 1.6% pediatricians opting for pharmacological therapies.

Preferred mode of management of FGID

Also, when asked which was the preferred mode of FGID management, 80.4% pediatricians rated nutritional modification as the second-best option after reassurance and education (89.2% pediatricians), followed by 87.4% pediatricians rating pharmacological intervention as the last option.

Practice preference for management of FGID

Nutritional management of FGID - best options for breastfed babies

For baby suffering from regurgitation while on breastfeed

Majority of pediatricians (73.4%) believe that a breastfed baby’s symptoms of regurgitation can be best managed by switching to 100% whey partially hydrolyzed protein formula. As per the results, most opted sequence for management of regurgitation while on breastfeed is

1. Switch to 100% whey partially hydrolyzed protein formula, 2. Switch to lactose free formula, 3. Any Sequence to be followed, 4. Switch to soy formula and 5. Cow based milk formula (Figure 1).

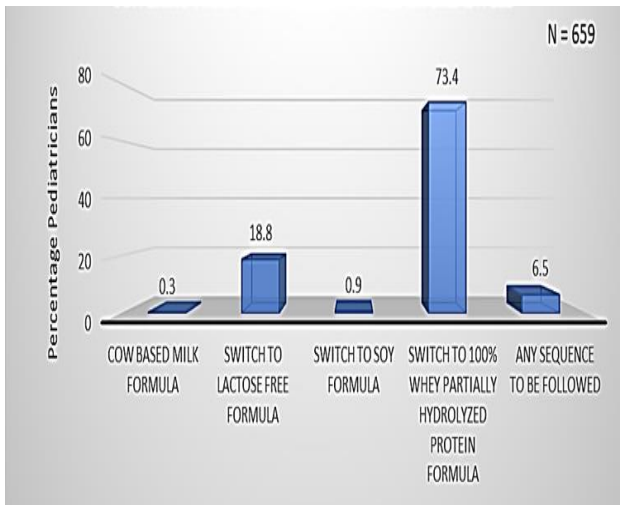


Figure 1: Best option for nutritional management of baby suffering from regurgitation while on breastfeed.

For baby suffering from colic while on breastfeed

If breastfed infants are suffering from colic, 46.8% pediatricians believe that a switch to 100% whey partially hydrolysed protein formula is the best management option, followed by 28.7% pediatricians opting for pre/probiotics, 13.5% suggesting a switch to lactose free formula, 9.3% suggesting a switch to extensively hydrolyzed protein formula, 0.8% opting for switch to soy formula and no pediatrician (0%) suggesting cow based milk formula.

For baby suffering from constipation while on breastfeed

While for constipation, 62.2% pediatricians believe a switch to 100% whey partially hydrolyzed protein formula is the best management option followed by 18.0% pediatricians advising use of pre/probiotics, 11.7% suggesting a switch to extensively hydrolyzed protein formula, while 8.1% say that any of the above sequence can be followed.

Preference of factors that help in deciding formula feed in FGIDs

When asked to rate the factors that help in deciding the formula feed, 71.4% pediatricians rated clinical recommendations at number 1 position, followed by 34.6% rating patient acceptability at second position, 34.7% rating own clinical experience at third position, while 50.3% rating cost factor at fourth position (Table 3).

Table 3: Factors that help in deciding the formula feed.

Factors	1 No. (%)	2 No. (%)	3 No. (%)	4 No. (%)
Clinical recommendation (n=746)	533 (71.4)	131 (17.6)	31 (4.2)	51 (6.8)
Cost factor (n=746)	55 (7.4)	148 (19.8)	168 (22.5)	375 (50.3)
Patient acceptability (n=746)	95 (12.7)	258 (34.6)	283 (37.9)	110 (14.7)
Own clinical experience (n=746)	82 (11.0)	207 (27.7)	259 (34.7)	198 (26.5)

DISCUSSION

Functional GI disorders are currently best understood as bio-psychosocial disorders lacking an identifiable pathology but affecting the complex interactions between the brain and gut.⁵ Several studies discuss the role of infant formulas in allergy prevention⁶ and management of FGID symptoms in infants who are non-breast fed whereas the management of FGID symptoms in breast fed infants has not been investigated. Therefore, our survey was designed to understand pediatricians' perspectives on the common FGIDs associated with different feeding practices in infants and management options such as lactose free formula, cow-based milk formula, soy formula and 100% whey partially hydrolysed protein formula.⁷⁻⁹

Knowledge on FGID

Functional gastrointestinal disorders (FGIDs) such as regurgitation, constipation and infantile colic are extremely common among infants across the globe with an estimated global incidence ranging from 40-60%, thus affecting approximately half the population of infants.¹⁰ Consistent with these findings, in our survey also it was observed that approximately half of the pediatricians surveyed (42.8%) came across 3-5 cases of FGIDs out of 10 in their daily practice. Also, according to pediatricians, colic is the most common GI disorder followed by gassiness/fussiness and regurgitation. A possible reasoning for this could be the nonorganic etiology like exacerbation of normal infant behaviour by a mixture of physiological and psychosocial factors.¹¹ This finding was supported by the fact that approximately 97% pediatricians in our survey reported colic and regurgitation as the most common GI issues in the younger age group of 0-6 months, while constipation as common in children >6 months of age. Similar observation of high prevalence of colic (40% prevalence) in infants below the age of 4 months was reported by more than 63% of physicians across all countries, represented in this survey.¹²

Attitude on management of FGID

When we analysed pediatricians' answers for association of FGIDs with different feeding practices, majority of them reported of having come across FGIDs in infants who were formula fed (59.4%) compared to lower number of pediatricians (36.4%) reporting FGIDs in infants with combination of breastfeeding and formula feeding, while only 4.2% reporting its association in exclusively breastfed infants. Similar observation was reported by Koopman et al. in their study on infants under age one, where the risk of acute gastrointestinal illness in infants receiving formula feed was six times greater than in infants receiving breast milk.¹³ Yet another meta-analysis by Chien and Howie¹⁴ showed that infants who were fed formula or a mixture of formula and human milk were 2.8 times (95% Confidence interval, 2.4-3.1) more likely to develop gastrointestinal infection than those who were exclusively breast-fed. Moreover, as per a survey of pediatricians performed in the Middle East and North African region, 37% pediatricians stated that formula feeding was the most important risk factor for infantile colic.¹²

However recent studies have demonstrated that selective nutritional supplement-based formula-feeds have been effective in the management of FGIDs, as discussed in the next paragraphs. Also, according to a prospective observational study by Bellaiche et al conducted with the help of 273 French pediatricians, FGIDs were extremely common in infants up to six months of age and had a negative impact on quality of life.¹⁵ Consistent with this finding, and that of Salvatore et al in our survey also 93.9% pediatricians reported that FGID impacts quality of life of infants and caregivers.²

As per the review by Salvatore et al guidelines recommend that by providing complete and updated parental education, reassurance and nutritional advice, healthcare professionals can optimise the management of FGIDs and related symptoms and reduce the inappropriate use of medication or dietary interventions. Following the guidelines, in our study also, majority (99.7%) of pediatricians believed and 90.6% said that they preferred reassurance and education as the best management option and only 1.6% pediatricians believe in pharmacological treatment option.²

Practice preference for management of FGID

When considering nutritional management options, there are various published randomized controlled trials (RCTs) on infants who are exclusively formula fed wherein it was observed that partially hydrolysed whey protein formula can be of benefit to infants having regurgitation and colic respectively, whereas there are no studies published on breastfed infants. In our survey, we tried to understand pediatricians' perspectives on treating breast fed infants with various nutritional supplement options and found that 73.4% believe a switch to 100%

whey partially hydrolysed protein formula is the best option for regurgitation, 46.8% pediatricians believed it to be best for colic and 62.2% believed it to be best for constipated infants.^{7,9}

For all these management options, there are various factors that pediatricians consider while deciding the treatment. For most pediatricians, (71.4%), clinical recommendations help them in deciding the formula feed, followed by patient acceptability, their own clinical experience and lastly the cost factor. Various studies and randomized trails suggest the benefit of nutritional supplements in infants with colic, regurgitation and constipation and it has also been suggested that pharmacological therapy appears to offer no benefit for FGIDs that occur early in life.^{2,7-9} The present study thus contributes to the conceptualization of a doctor's perspective that is instrumental to the diagnosis and treatment of FGIDs in those infants who may be breastfed. A limitation of this survey was that it only collected information on healthcare practitioners' self-reported diagnosis and management of FGID and determination of actual local clinical practice was not performed.

CONCLUSION

FGIDs and related symptoms present a common burden in infancy, as they have a negative impact on the short-term and long-term health outcomes of the infants, reduce families' quality of life and increase healthcare system costs. The optimal management of FGIDs in infancy should start with parental education and reassurance, accompanied by proper nutritional guidance. It is unlikely that any pharmacological intervention will be necessary once an organic cause of the symptoms has been excluded. However, pharmacological therapies are often unnecessary and misused, and may cause adverse effects. Breastfeeding should be recommended and supported, even when infants display persistent and severe FGIDs. In place of standard pharmacological therapies partially hydrolyzed formulas can be a safe and effective option as they seem to offer some promise over native protein in the dietary management of common functional gastrointestinal symptoms. In conclusion, diagnosis of FGIDs in infants is usually based on information from parents and the clinical examination of the child, including weight assessment. This survey quantified the pediatricians' perspectives from across India on selecting the best out of the various treatment approaches along with nutritional management for FGIDs and presents a useful baseline approach for further well-designed epidemiological studies in the field of supplemental nutrition for breastfed infants.

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REFERENCES

1. Zeevenhooven J, Koppen IJN, Benninga MA. The new Rome IV criteria for functional gastrointestinal disorders in infants and toddlers. *Pediatr Gastroenterol Hepatol Nutr.* 2017;20(1):1-13.
2. Salvatore S, Abkari A, Cai W, Catto-Smith A, Cruchet S, Gottrand F, et al. Review shows that parental reassurance and nutritional advice help to optimise the management of functional gastrointestinal disorders in infants. *Acta Paediatr.* 2018;107(9):1512-20.
3. Kesavelu D, Sethi G, Bangale N, Anwar F, Rao S. Common gastrointestinal distress among infants: Role of optimal nutritional interventions. *Clinic Epidemio Glob Heal.* 2018;6(1):5-9.
4. Cai W, Bharadia L, Juffrie M, Cheah FC, Quak SH, Titapant V, et al. Prevalence and management of functional gastrointestinal disorders in infants: An Asian perspective. *Pediatr Gastroenterol Hepatol Nutr.* 2018;21(1):76-7.
5. Robin GS, Keller C, Zwiener R, Hyman PE, Nurko S, Saps M, et al. Prevalence of pediatric functional gastrointestinal disorders utilizing the Rome IV criteria. *J Pediatr.* 2018;195:134-9.
6. Vandenplas Y, Munasir Z, Hegar B, Kumarawati D, Suryawan A, Kadim M, et al. A perspective on partially hydrolyzed protein infant formula in nonexclusively breastfed infants. *Kore J Pediatr.* 2019;62(5):149-54.
7. Indrio F, Riezzo G, Giordano P, Ficarella M, Miolla MP, Martini S, et al. Effect of a partially hydrolysed whey infant formula supplemented with starch and *Lactobacillus reuteri* DSM 17938 on regurgitation and gastric motility. *Nutrien.* 2017;9(11):1181.
8. Vandenplas Y, Cruchet S, Faure C, Lee H, Di Lorenzo C, Staiano A, et al. When should we use partially hydrolysed formulae for frequent gastrointestinal symptoms and allergy prevention? *Acta Paediatr.* 2014;103(7):689-95.
9. Di Costanzo M, Nocerino R, Cosenza L, Di Scala C. Efficacy of a partially hydrolyzed whey formula on infant colic: A randomized controlled trial. *Int J Nutr Sci Foo Tech.* 2018;4(6):37-44.
10. Vandenplas Y, Abkari A, Bellaiche M, Benninga M, ChouraquiJP, Cokura F-C, et al. Prevalence and health outcomes of functional gastrointestinal symptoms in infants from birth to 12 months of age. *J Pediatr Gastroenterol Nutr* 2015;61(5):531-7.
11. Barr RG. Colic and crying syndromes in infants. *Pediatr.* 1998;102(5E):1282-6.
12. Indrio F, Miqdady M, Al Aql F, Haddad J, Karima B, Khatami K, et al. Knowledge, attitudes, and practices of pediatricians on infantile colic in the Middle East and North Africa region. *Bi Me Centr Pediatr.* 2017;17(1):187.
13. Koopman JS, Turkish VJ, Monto AS. Infant formulas and gastrointestinal illness. *Americ J Publ Heal.* 1985;75(5):477-80.
14. Chien PF, Howie PW. Breast milk and the risk of opportunistic infection in infancy in industrialized and non-industrialized settings. *Adv Nutr Res.* 2001;10:69-104.
15. Bellaiche M, Oozeer R, Gerardi-Temporel G, Faure C, Vandenplas Y. Multiple functional gastrointestinal disorders are frequent in formula-fed infants and decrease their quality of life. *Acta Paediatr.* 2018;107(7):1276-82.
16. Vandenplas Y, Alturaiki MA, Al-Qabandi W, AlRefaee F, Bassil Z, Eid B, et al. Middle East consensus statement on the diagnosis and management of functional gastrointestinal disorders in <12 months old infants. *Pediatr Gastroenterol Hepatol Nutr.* 2016;19(3):153-61.
17. Yachha SK, Srivastava A, Mohan N, Bharadia L, Sarma MS. Management of childhood functional constipation: Consensus practice guidelines of Indian Society of Pediatric Gastroenterology, Hepatology and Nutrition and Pediatric Gastroenterology Chapter of Indian Academy of Pediatrics. *Indi Pediatr.* 2018;55(10):885-92.

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