ORIGINAL RESEARCH PAPER

Psychiatry

IMPACT OF BREASTFEEDING ON MENTAL HEALTH OF CHILDREN: A CASE CONTROL STUDY

KEY WORDS: artificial feeding, breast feeding, mental health disorders,

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ABSTRACT

Background: Breastfeeding has many health benefits, both in the short term and the longer term, to infants and their mothers. There are an increasing number of studies that report on associations between breastfeeding and long-term protection against chronic disease, additionally it may reduce the risk of psychological and behavioral disorders among children.

Aim: To study the impact of breastfeeding on mental health disorders of school-age children.

Methods: This study was conducted on a group of children aged between 6 to 12 years, who were divided into two groups: the patient group included 50 children who were diagnosed with behavioral and mental health disorders according to DSM 5 criteria of diagnosis and were recruited from the outpatient psychiatry clinic of Government medical college Anantnag from October 2019 to September 2020 and a control group with apparently age and gender matched healthy children with no history of psychological manifestations.

Result: The mean age was 8.4±2.2 years. There were 15 (30.0%) female and 35 (70.0%) male patients, with the highest percentage having attention-deficit hyperactive disorder (ADHD) (72.0%), followed by obsessive-compulsive disorder (OCD) (24.0%), learning disorder (10.0%), and conduct disorder (2.0%). The majority of the cases (29) were mixed fed (58.0%), 11 (22.0%) were artificially fed, and 10 (20.0%) were breastfed. There was a significant difference between artificial (bottle) feeding and mixed feeding regarding behavioral disease such as ADHD and OCD (*P* value> 0.001).

Conclusion: Breastfeeding has a positive impact on behavioral and mental health disorders in children and an increase in the duration of breastfeeding is associated with decrease in the incidence of psychological and behavioral disorders.

INTRODUCTION

Breastfeeding has been associated with better intellectual function in children in several epidemiological studies (1). Confounding by parental and socio-environmental factors such as maternal IQ, smoking during pregnancy, parental education, and quality of home environment constitutes a major issue in these studies, since this association may be reduced to a no significant trend after statistical control for such variables (2). Nevertheless, the majority of recent investigations have supported the existence of an association between duration of breastfeeding and child cognition beyond parental and socio-environmental factors (3,4,5,6). Inconsistent assessment of breastfeeding duration and intensity, and variability in the tasks used to assess child intelligence, may have accounted for negative findings in some studies (7,8).

The evidence available for the association between breastfeeding and behavior disorders in childhood is indeed challenging, so this study was conducted.

METHODS

This was a case–control study carried out on a group of children aged from 6 to 12 years divided into two groups: cases included 50 children who were diagnosed with behavioral and mental health disorders according to DSM 5 criteria of diagnosis and were recruited consecutively from outpatient psychiatry clinic of Government Medical college Anantnag with history of 10 breastfed, 29 mixed fed, and 11 artificial (bottle) fed and compared them with control group, which consisted of 50 apparently healthy children having acute, short-term illnesses with no history of psychological manifestations matched in age and sex, with history of exclusive breastfeeding. Children born Preterm, low birth weight, those with history of admission to NICU or maternal drug use and history of chronic illness were excluded from the study.

All cases and control groups were subjected to the following:

1. Thorough full medical history taking according to a specially designed pediatric sheet with emphasis on nutritional (feeding) history, developmental, family, and social history.
2. The Revised Behavior Problem Checklist (Quay, 1983): it was an 89-item questionnaire used to assess parents' report of child problem behaviors under six constructs: CD, socialized aggression, attention problems/ immaturity, anxiety/ withdrawal, psychotic behavior, and motor excess using a three-point Likert scale (0=no problem and 2=severe problem). The administration and scoring are straightforward. The raters respond to the 89 items on the top page of the carbonless Test Booklet, and responses are transferred to the bottom sheet, which contains scoring instructions and a scoring key. The RBPC Profile Sheet is used to record the obtained raw and T-scores and to plot the pattern of the test results. The data was tabulated and analyzed. χ^2 test and Fisher exact test were used. P value of 5% was taken as significant.

RESULTS

The age of the studied children ranged between 6 and 12 years, with a mean age of 8.4±2.2 and 8.8±3.2 years for cases and control groups, respectively, with no statistical significant difference between them (table 1). Regarding sex distribution, 15 (30.0%) were females and 35 (70.0%) were males compared with 16 (32.0%) females and 34 (68.0%) males of control group, with no statistically significant difference between them (table 1).

Table 1 Comparison between the patient and control groups regarding age and sex

	Control group	Patient group	Independent *t* test	
Variables	*N*=50	*N*=50	*t*/*X**	*P* value
Age (years)				
Mean±SD	8.8±3.2	8.4±2.2	–0.728	0.468
Range	6–12	6–12		
Sex [*n* (%)]				
Female	16 (32.0)	15 (30.0)	0.047*	0.828
Male	34 (68.0)	35 (70.0)		

Regarding the type of feeding in the present study, 100 children were divided into 50 children diagnosed as having behavioral and mental health disorders, where the majority (29 children) were mixed fed (58.0%), 11 (22.0%) were artificially fed, and 10 (20.0%) were breastfed, and 50

(100.0%) children were exclusive breastfed as a control group, and there were highly statistically significant differences between them, with P value more than 0.001.

In the current study, there was a highly statistically significant difference between artificial (bottle) feeding and mixed feeding in behavioral disease, attention-deficit hyperactive disorder (ADHD), and obsessive-compulsive disorder (OCD), with highly significant difference (P>0.001), whereas there was no significant difference between other groups (table 2).

Table 2 The relation between feeding type and behavioral and mental health disorders (*N*=100)

	Feeding type [n (%)]				
Diagnosis	Breastfeeding (*N*=60)	Mixed feeding (*N*=29)	Bottle feeding (*N*=11)	Test	Significance
Diseased					
Yes	10 (16.7)	29 (100.0)	11 (100.0)	66.7	<0.001
No	50 (83.3)	0	0		
ADHD					
Yes	10 (16.7)	18 (62.1)	8 (72.7)	24.7	<0.001
No	50 (83.3)	11 (37.9)	3 (27.3)		
ODD					
No	60 (100.0)	29 (100.0)	11 (100.0)	–	–
OCD					
Yes	0	9 (31.0)	3 (27.3)	20.6	<0.001
No	60 (100.0)	20 (69.0)	8 (72.7)		
ASD					
No	60 (100.0)	29 (100.0)	11 (100.0)	–	–
Anxiety disorder					
No	60 (100.0)	29 (100.0)	11 (100.0)	–	–
Depression					
No	60 (100.0)	29 (100.0)	11 (100.0)	–	–
Bipolar disorder					
No	60 (100.0)	29 (100.0)	11 (100.0)	–	–
Learning disorder					
Yes	0	3 (10.3)	2 (18.2)	8.9	0.012
No	60 (100.0)	26 (89.7)	9 (81.8)		
Conduct disorder					
Yes	0	1 (3.4)	0	2.5	0.29
No	60 (100.0)	28 (96.6)	11 (100.0)		

ADHD, attention-deficit hyperactive disorder; OCD, obsessive-compulsive disorder; ODD, oppositional defiant disorder.

DISCUSSION

One of the major challenges facing communities is to generate knowledge needed to improve the children with behavior and mental health disorders. Many studies have shown the benefits of breastfeeding for both children and mothers, regardless of socioeconomic status (9). Breastfeeding reduces the risk of some diseases that may occur at different stages of life. It not only protects against infections but may also reduce the risk of overweight and diabetes and protect the mother against breast and ovarian cancers and type 2 diabetes (10). Moreover, children breastfed for at least 6 months have a higher IQ in childhood (11), and this effect is maintained into adolescence (12) and adulthood (10). The link between breastfeeding and children's behavior development depends on a higher frequency of breastfed meals and the duration of exclusive breastfeeding during the first year of life (13). Cases were taken consecutively from outpatient psychiatry clinic of Government Medical College Anantnag from October 2019 to September 2020. All the children of studied group were full in term with normal birth weight, no history of NICU admission, and received their vaccination. Regarding the behavior and mental health disorder in the current study, the result found that ADHD was the commonest, with the highest percentage (72.0%) followed by OCD (24.0%), learning disorder (10.0%), and CD (2.0%) among the studied children. Similar results are shown by Al Hamed *et al.* (14), who found that ADHD is one of the most common mental disorders that develop in children, and it becomes apparent in the preschool and early school years. Our results showed that ADHD was associated with artificial feeding more than mixed feeding or breastfeeding; this highlights the importance of breastfeeding in lowering the risk of behavioral disorders among children. This was similar to the study done by Adesman *et al.* (15) in which they evaluated the prevalence of ADHD among breast-fed and formula-fed infants, and they reported a statistically significant difference in formula-fed infants with 5-fold increase in prevalence of ADHD than breast-fed infants.

CONCLUSION

Breastfeeding can reduce the risk of many behavioral and developmental problems such as ADHD, OCD, anxiety problems, and attention problems. Breastfeeding duration has a positive association with behavioral and mental health disorders, with shorter duration of breastfeeding being a risk factor for behavioral problem.

REFERENCES

1. Anderson JW, Johnstone BM, Remley DT. Breast-feeding and cognitive development: a meta-analysis. *Am J Clin Nutr* 1999;70:525–35.
2. Jacobson SW, Chiodo LM, Jacobson JL. Breastfeeding effects on intelligence quotient in 4- and 11-year-old children. *Pediatrics* 1999;103:e71.
3. Belfort MB, Rifas-Shiman SL, Kleinman KP, et al. Infant feeding and childhood cognition at ages 3 and 7 years. Effects of breastfeeding duration and exclusivity. *JAMA Pediatri* 2013;167:838–44.
4. Kramer MS, Aboud F, Mironova E, et al.; Promotion of Breastfeeding Intervention Trial (PROBIT) Study Group. Breastfeeding and child cognitive development: new evidence from a large randomized trial. *Arch Gen Psychiatry* 2008;65:578–84.
5. Julvez J, Guxens M, Carsin AE, et al. A cohort study on full breastfeeding and child neuropsychological development: the role of maternal social, psychological, and nutritional factors. *Dev Med Child Neurol* 2014;56:148–56.
6. Quigley MA, Hockley C, Carson C, Kelly Y, Renfrew MJ, Sacker A. Breastfeeding is associated with improved child cognitive development: a population-based cohort study. *J Pediatr* 2012;160:25–32.
7. Drane DL, Logemann JA. A critical evaluation of the evidence on the association between type of infant feeding and cognitive development. *Paediatr Perinat Epidemiol* 2000;14:349–56.
8. Jain A, Concato J, Leventhal JM. How good is the evidence linking breastfeeding and intelligence? *Pediatrics* 2002;109:1044–53.
9. Horta BL, Christian LM, Cesar GV (2015). Breastfeeding and intelligence: a systematic review and meta– analysis. Acta Paediatr 104:14–19.
10. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J *et al.* (2016). Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet 387:475–490.
11. Fonseca AL, Albernaz EP, Kaufmann CC, Neves IH, de Figueiredo VL (2013). Impact of breastfeeding on the intelligence quotient of eight-year-old children. J Pediatr 89:346–353.
12. Kafouri S, Kramer M, Leonard G, Perron M, Pike B, Richer L *et al.* (2013). Breastfeeding and brain structure in adolescence. Int J Epidemiol 42:150–159.
13. Boucher O, Julvez J, Guxens M, Arranz E, Ibarluzea J, de Miguel MS *et al.* (2017). Association between breastfeeding duration and cognitive development, autistic traits and ADHD symptoms: a multicenter study in Spain. Pediatr Res 81:434–442.
14. Al Hamed JH, Taha AZ, Sabra AA, Bella H (2008). Attention deficit hyperactivity disorder (ADHD) among male primary school children in Dammam, Saudi Arabia: prevalence and associated factors. J Egypt Public Health Assoc 83:165–182.
15. Adesman A, Soled D, Rosen L (2017). Formula feeding as a risk factor for Attention-Deficit/Hyperactivity Disorder: is bisphenol a exposure. J Dev Behav Pediatr 38:545–551.