Original Article

Maternal psychiatric morbidity and childhood malnutrition

Muzamil Shabana Ejaz[1], Ayesha Sarwat[2], Tahniat Aisha[3]

ABSTRACT

Objective: To determine maternal psychiatric morbidity and its relation with malnutrition in their children.

Methodology: It was a case control study conducted at Nutrition Rehabilitation Unit of Department of Pediatrics, Civil Hospital Karachi, Pakistan from March to September 2011. Samples included hundred children between 3 to 36 months of age. The number of cases and control were fifty each. Children with moderate and severe malnutrition according to WHO classification were included in the case group whereas controls were children of the same age group and normal weight, coming to the department with common illnesses like acute respiratory infections, diarrhea, during the same time period. Mothers of both groups were screened for a probable psychiatric morbidity using HADS; "The Hospital Anxiety and Depression Scale", a psychiatric screening instrument. The score of more than eleven on either sub scale of HADS was considered significant for presence of psychiatric illness in the mothers. Data was analyzed through SPSS 15. Statistical analysis of data was done by using Odds ratio, stratification and logistic regression for each variable in both case and control groups.

Results: Maternal HADS score was significantly high >21 in 50% of cases whereas in controls it was 46% (O.R=0.85 (95%Cl=0.38-1.86). Of the malnourished 90% and controls, 84% belong to low income status OR=1.71 (95% CI 0.52-5.6) whereas low birth weight was 64% in cases and 56% in controls OR=1.39 (95% Cl 0.62-3.11).

Conclusion: Maternal mental health affects the nutritional status of the children. Anxiety and depression are common psychiatric illnesses found in our society as suggested by significantly high HADS scores of mothers in both cases and control groups. It also shows that it is difficult to establish a straightforward relationship between maternal psychiatric illnesses and poor nutritional status of their children. However increasing age of mothers, low birth weight of child, increasing family size and low income are associated important risk factors for predicting increasing HADS scores in mothers of malnourished children.

KEY WORDS: Maternal, Psychiatric morbidity, Childhood, Malnutrition.

Pak J Med Sci October - December 2012 Vol. 28 No. 5 874-878

How to cite this article:

Ejaz MS, Sarwat A, Aisha T. Maternal psychiatric morbidity and childhood malnutrition. Pak J Med Sci 2012;28(5):874-878

Correspondence:

Dr. Muzamil Shabana Ejaz,
Paediatrics Unit-II,
Dow University of Health Sciences & Civil Hospital,
Karachi - Pakistan.
E-mail: muzamilejaz08@yahoo.com

* Received for Publication: May 17, 2012
* 1st Revision Received: June 8, 2012
* 2nd Revision Received: July 10, 2012
* Final Revision Accepted: July 15, 2012

INTRODUCTION

Malnutrition is one of the major health issues globally, nearly 50.6 million children under five are malnourished and 90% of these children belong to developing countries.[1] Apart from inadequate food intake many other factors are also responsible for under nutrition in children, studies have shown that proper behavior and attitude of mothers has an essential role in maintaining healthy nutrition in children.[2-4] Malnutrition is also associated with large

family size and lack of adequate parental education. In addition recurrent episodes of infections also lead to a vicious cycle of illness and malnutrition.[5]

Estimates of depression in women in developing countries including Pakistan vary from 15-57% due to factors like socio-economic distress and relationship problems.[6] Recent researches have shown that maternal depression is associated with compromised parenting behavior, non-responsive care giving practices and decrease in breast feeding leading to malnutrition in children.[7,8] Studies done earlier also reported that poor psychological behavior in mothers was associated with malnutrition in children.[9] A study done in South India showed that current major depression (OR 3.2, 95% CI 1.1 to 9.5), and low maternal intelligence (OR 3.8, 95% CI 1.3 to 11.1) were associated with malnutrition in children.[10]

Different validated questionnaires are used to assess maternal mental health status; a study showed that the total score of HADS (The Hospital Anxiety and Depression Scale) is a significant tool for evaluation of psychiatric morbidity.[11] In Pakistan very few local reports are available in medical literature which has investigated maternal mental health status and its effects on nutrition of the children. Keeping the scenario in view this study was conducted to determine maternal psychiatric morbidity and its relation with malnutrition in their children.

METHODOLOGY

This hospital based case control study was conducted at Nutrition Rehabilitation Unit of Department of Pediatrics, Civil Hospital Karachi, Pakistan from March to September 2011 after the approval from ethical review board of the Dow University of Health Sciences. Civil Hospital Karachi is one of the largest tertiary care teaching hospital catering urban peri-urban areas of Sindh, Pakistan.

Sample included hundred children aged 3 to 36 months. The number of cases and controls were fifty each. Sample size was estimated taking 20% prevalence of mental disorders among mothers of malnourished children.[12] Cases were children admitted in nutritional rehabilitation unit with, moderate and severe malnutrition defined as weight for height ratio<-2SD and <-3SD respectively according to WHO classification of malnutrition in children whereas the controls were children with normal weight admitted with common illnesses like acute respiratory infections, diarrhea. Children with mild malnutrition, <1SD and acute severe illnesses, meningitis, encephalitis, severe pneumonia and chronic disorders like neurological deficits and congenital anomalies were excluded.

Mothers of both groups were screened for a probable psychiatric morbidity using HADS; "The Hospital Anxiety and Depression Scale". The HADS included two sub scales of anxiety and depression with highest score of twenty-one for each illness respectively. Score between 0-7 was considered normal, 8-10 was border line whereas ≥11 was taken as significant psychiatry illness on either sub scales.[13] WHO classification of malnutrition was used to determine the weight for height ratio of the children.[14] One of the variables included in this study was family income per month, families with income of five thousand or less were considered poor. Another significant variable was family size; more than three children were taken as large family size.

Parents education was also an important variable considered in this study, less than five years was low and high was more than five years of either school or madrassa education, mother's age of thirty years or more was taken as old age and birth weight of children less than 2500gm was considered as low and 3200gm as normal weight. Data was analyzed through SPSS 15, both cases and control groups were evaluated by Odds ratio (OR). Stratified and logistic regression analysis was done to determine OR after controlling the confounders.

RESULT

Sample size of hundred was included in the study. There were fifty cases and controls each. In the case group mean age was 26.9 months (SD±9.4) whereas in the controls it was 28.2(SD±9.1). In the malnourished group there were 30% males and 70% females while in control group 34% were males and 66% were females.

The association of malnutrition and selected variables are shown in Table-I. Maternal HADS score was significantly high more than 21 in 50% of cases (25) whereas in controls it was 46% (23) O.R=0.85 (95%Cl=0.38-1.86) .Of the malnourished 45(90%) and controls 42(84%) belong to low income status or =1.71 (95% CI 0.52-5.6) whereas low birth weight was 64% (32) in cases 56% (28) in controls OR=1.39 (95% Cl 0.62-3.11). Logistic regression was used to estimate the simultaneous effect of mothers HADS and selected variables including age of mothers, number of children and birth weight on nutrition of the child, (Table-II). Maternal age and mental health showed a significant effect on malnutrition

Table-I: Crude odds ratio (OR) of the association between primary malnutrition in children and selected risk factors (N =100).

Variables		*Case*	*Control*	*OR*	*95% CI*	*P-Value*
Mother's HADS	≤21	25	27	0.85	0.38 – 1.86	0.68
	>21	25	23			
Mother's Age	≤30	26	27	0.92	0.42 – 2.02	0.84
	>30	24	23			
No. of Children	≤3	15	17	0.83	0.35 – 1.93	0.66
	>3	35	33			
Income status	<5000	45	42	1.71	0.52 – 5.6	0.37
	>5000	5	8			
Mother's Education Years	≤5	47	48	0.65	0.10 – 4.08	0.64
	>5	3	2			
Birth Weight of Child	Low	32	28	1.39	0.62 – 3.11	0.414
	Normal	18	22			

in children OR 0.9(95% CL 0.42-2.02). The adjusted OR for HADS score of mothers was not found to be significantly different from the crude OR 0.85 (95% CI 0.38-1.88) whereas association between mothers age and mental health, age of mother OR= 1.06, family size OR=0.99 and child's birth weight OR=1.42 persisted when analyzed by logistic regression.

DISCUSSION

Child care practices are important for proper growth of children. It has been suggested that poor maternal mental health may adversely affect the child care practices and impaired growth and development of the children. In this study mothers mental health and its association with poor nutritional status of their children is discussed.

In our study most of the children from both control and case groups were between 24 to 36 months of age. There was slightly high frequency of females as compared to males, other studies has also shown similar findings.[15] The higher incidence of malnutrition in females is probably due to social risk of gender bias in child care.

Mental health morbidity in the mothers was found to be significantly high in both cases and control groups in the present study, reflecting increase frequency of mental health problems in the society in general and especially in the females. In our view multiple factors including lack of empowerment, poverty and decreased social interactions may be responsible for depression and anxiety in women. A recent report from WHO showed that exposure to various type of violence like domestic and gender based, conflict situations and natural disaster has also emerged as important risk factors for psychiatric illnesses in females in developing countries like Pakistan.[16]

Maternal psychological illness extends beyond them involving health and growths of their children. Studies have shown two to three times high maternal depression in developing countries compared to developed countries.[17] A recent report showed that maternal depression is associated with early childhood underweight and stunting (Odd ratio 1.5).[18] Postnatal maternal depression in underdeveloped countries is also one of the significant mental health problems, estimated to be 8-10%[16], contribute to the risk of growth impairment through several ways, including cessation of breast feeding and decrease maternal care of infants needs.[19,20] Inadequate nutrition, lack of antenatal support and substance abuse are some of the factors responsible for psychiatric diseases during pregnancy and after child birth resulting in intrauterine growth retardation and low birth weight. In a study done in India, maternal psychological morbidity was found to be associated with low birth weight (Odd ratio (1.44)).[21] Our data

Table-II: Estimates of simultaneous effect of mother's HADS, age of mother, number of children, and birth weight on the nutritional status of the child through logistic regression. (N=100).

	Coefficient	*Standard Error*	*OR*	*95% C.I*	*P-value*
Constant	-0.088	0.57	0.91	- - -	0.69
Mother's HADS	-0.157	0.40	0.85	0.38 – 1.88	0.90
Age of Mother	0.061	0.52	1.06	0.37 – 2.99	0.98
Number of Children	-0.01	0.63	0.99	0.28 – 3.43	0.48
Birth weight of Child	0.35	0.50	1.42	0.53 – 3.81	0.87

also revealed a significant association between low birth weight, maternal psychiatric illnesses and malnutrition in the children.

Many studies have shown association of other variables including socio-economic status, age of mothers and number of children with maternal mental health morbidity and malnutrition in their children. A data from Pakistan showed that maternal mental distress was associated with under nutrition in children.[22] Depression and anxiety are common psychiatric morbidities which are linked with poverty. In a study done in rural Bangladesh mothers with depressive symptoms had multiple environmental risk factors including low-income and education.[23]

The major underlying factor leading to malnutrition in low income societies being the lack of enough food for healthy life and well being of the mothers as a result of which they develop low-self-esteem with impaired care taking capacity which is important for child growth and development.[24,25] In the current study a significant association was found between low-income status and maternal psychiatric morbidity with under nutrition in children (OR: 1.71). In a cohort study prevalence of malnutrition in children of adolescent mothers was more than twice as high as in children of mothers $\geq$ 34 years old. Higher the mother parity, higher the prevalence of underweight and stunting.[15] In our study also mothers age showed an important relationship with HADS score and under nutrition in children (OR: 1.06).

In the current study although a significant association between maternal psychological illnesses and malnutrition in children existed even after adjusting variables including family income, mothers age, birth weight of child and number of children but these factors has shown same influences in control group also, therefore it is hard to establish a cause-effect relationship between maternal psychiatric morbidity and malnutrition in children.

Limitation of the study: Is the small sample size due to which the results cannot be generalized.

CONCLUSION

Maternal mental health affects the nutritional status of the children. Anxiety and depression are common psychiatric illnesses found in our society as suggested by significantly high HADS scores of mothers in both cases and control groups. . It also shows that it is difficult to establish a straightforward relationship between maternal psychiatric illnesses and poor nutritional status of their children. However increasing age of mothers, low birth weight of child, increasing family size and low income are associated important risk factors for predicting increasing HADS scores in mothers of malnourished children.

RECOMMENDATIONS

An effective approach at different levels is needed to ensure health and well-being of children. Intervention programmes to improve maternal mental health should be considered for preventing child malnutrition. Preventive interventions including formation of social support groups which provide education regarding physical and mental health to affected families and mothers can be accomplished in developing countries like Pakistan with financial assistance of both government and private sector. Early identification and management can be accomplished by incorporating mental health in primary health care to provide timely referral and care. Maternal mental health management programme should be included in child health programmes like integrated management of child and neonatal illnesses (IMNCI) in developing countries. Education and training of medical students and health care providers regarding psychiatric health issues should be carried out in medical universities and health facilities.

ACKNOWLEDGMENT

Authors are thankful to Mr. Adnan Biostatic Department of Dow University of Health Science for statistical analysis of the data and Mr. Furqan Baig for secretarial assistance.

REFERENCES

1. Faruque AS, Ahmed AM, Ahmed T, Islam MM, Hussain MI, Roy SK, et al. Nutrition: basis for healthy children and mothers in Bangladesh. J Health Popul Nutr. 2008;26(3):325-339.
2. Malnutrition, Wikipedia, http://en-wikipedia.org/wiki/malnutrition access online May 5 2012.
3. Janevic T, Petrovic O, Bjelic I, Kubera A. Risk factors for childhood malnutrition in Roma settlements in Serbia. BMC Public Health. 2010;10:509. doi:10.1186/1471-2458-10-509.
4. Musaiger AO, Hassan AS, Obeid O. The Paradox of nutrition related diseases in the Arab countries. The need for action. Int J Environ Res Public Health. 2011;8(9):3637-3671.
5. Black RE, Allen H, Bhutta ZA, Caulfield LE, De Onis M,Ezzati M et al. Maternal and Child under nutrition, global and regional exposures and health consequences, maternal and child under nutrition. Lancet . 2008;371(9608)243-60.
6. Hussain N, Creed F, Tomenson B. Depression and social stress in Pakistan. Psycho Med. 2000;30:395-402. doi:10 1017/500332917000/1707 PMID:10824659.

7. Mclearn KT, MinKovi CS, Strobino DM, Marks E, Hou W. Maternal depressive symptoms at 2 to 4 months postpartum and early parenting practices. Arch Pediatr Adolesc Med. 2006;160(3):279-284.
8. Ross J, Hanion, Mehin G, Alem A,Tesfye F,Patel V et al. Perinatal mental distress and infant morbidity in Ethiopia: a cohort study. Arch Dis Child Fetal Neonatal. 2011;96:F59-F64.
9. Kerr MA, Bogues L, Kerr DS. Psychological functioning of mothers of malnourished children. Pediatrics. 1978;62(5):778-784.
10. Anoop S, Saravan B, Joseph A,Cherian A,K S Jacob. Maternal depression and low maternal intelligence as risk factors for malnutrition in children: a community case-control study from South India. Arch Dis Child. 2004;89:325–329.
11. Costantini M, Musso M, Viterbori P, Bonci F,Garrone O,Morraso G et al. Detecting psychological distress in cancer patients: validity of the Italian version of the Hospital Anxiety and Depression Scale. Support Care Cancer. 1999;7(3):121-127.
12. Harpham T, Huttly S, De Silva MJ, Abramsky T. Maternal mental health and child nutritional status in four developing countries. J Epidemiol Community Health. 2005;59(12):1060–1064.
13. Herrmann C. International experiences with the Hospital Anxiety and Depression Scale: a review of validation data and clinical results. J Psychosom Res. 1997;42:17-41.
14. Evaluation of the malnourished children, Management of severe malnutrition: a manual for physicians and other senior health workers, WHO, Geneva, 2002: 4-5.
15. Santos IS, Matijasevich A, Dominguess MR, Barrow AJD, Barrow FCF. Long lasing maternal depression and child growth at 4 years of age: A cohort study. J Pediatr. 2010;157(3):401-406.
16. WHOs Maternal mental health & child health and development, www.who.int/mentalhealth/prevention/suicide 2012. Access Online, July, 08 2012.
17. Fisher JR, Morrow MM, Ngoc NT, Anh LT. Prevalence nature, severity and correlates of postpartum depressive symptoms in Vietnam. BJOG. 2004;111(12):1353-1360.
18. Surkan PJ, Kennedy CE, Harlely KM, Black MM. Maternal depression and early childhood growth in developing countries; Systemic review and meta-analysis. Bull of the World Health Organization Geneva. 2011; 89(8).
19. Rehman A, Patel V, Maseiko J, Kirkwood B. The neglected "m" in MCH programmes – why mental health of mothers is important for child nutrition. Trop Med Int Health. 2008;13(4):579-583.
20. Stewart RC. Maternal depression and infant growth a review of recent evidence. Maternal Child Nutr. 2007;3(2):94-107.
21. Patel V, Prince M. Maternal Psychological Morbidity and low birth weight in India. Br J Psychi. 2006;188:284-285.
22. Rahman A, Lovel H, Iqbal Z, Harington R. Mothers mental health and infant growth: a case control study from Rawalpindi Pakistan. Child Care Development. 2004;30(1):121-127.
23. Black MM, Baqui AH, Zaman K, El Arifeen S, Black RE. Maternal depressive symptoms and infant growth in rural Bangladesh. Am J Clinical Nutrition. 2009;89(3):9515-9575.
24. Mental health aspects of women's reproductive health: a global review of the literature. World Health Organization Geneva; 2009.
25. Rahman A, Harrington R, Been J. Can maternal depression increase infant risk of illness and growth impairment in developing countries? Child Care Health Dev. 2002;28(1):51-56.

Authors Contribution:

MSE: Study conception and designing, Collection and statistical analysis of data, writing and editing of manuscript.

AS: Conception designing of study Statistical analysis of results.

TA: Collection, statistical analysis of data and literature search.

Authors:

1. Dr. Muzamil Shabana Ejaz, MBBS, MCPS, DCH, FCPS,
   Associate Professor,
   Department of Pediatrics,
2. Dr. Ayesha Sarwat, MBBS, MCPS, FCPS,
   Assistant Professor,
   Department of Psychiatry,
3. Dr. Tahniat Aisha,
   FCPS Postgraduate Trainee,
   Department of Pediatrics,

1-3: Dow University of Health Sciences & Civil Hospital Karachi, Karachi, Pakistan.