



Research Article

Association of Malnutrition with the Weaning Practices among Infants Visiting Pediatric Medicine Department of DHQ Hospital, Chakwal

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The authors equally contributed to literature review, study design, data collection and analysis and research writing.

Keywords

Infant, Malnutrition, Age at weaning

Abstract | Inappropriate weaning practices in infancy can lead to malnutrition that may have long-lasting impacts on health of the child. The objective of this study was to find out association of malnutrition in infants with the age at which weaning was started. This is an observational, cross-sectional study which was conducted in the Pediatric Medicine Department of DHQ Hospital, Chakwal, Pakistan from January 2020 to February 2020. All infants that presented to the hospital from January 2020 to March 2020 were included in the study after obtaining informed consent from their accompanying parent or guardian. Infants who were premature or had any congenital disease were excluded from the study. Information about the weaning practices of the infants was obtained from the consenting parent or guardian of each respective infant and recorded in the questionnaire. Weight and height of each infant was measured in kilograms and cm, respectively, and recorded. Data was entered in SPSS version 26 and analyzed for results. A total of 200 infants were included in the study, of which 94 (47%) of infants were less than 6 months old, and 106 (53%) were 6-12 months old. 102 infants (51%) were male and 98 (49%) were female. 113 (56.5%) infants under study were started weaning at less than 6 months of age of which 58 (51.3%) were found to be underweight for their age and 29 (25.7%) were shorter than the 50th percentile for their age. Of the 87 (43.5%) infants that were started weaning at 6 months of age or later, 52 (59.8%) were underweight for their age and 23 (26.4%) were shorter than the 50th percentile for their age. This study concludes that children in which weaning is started before 6 months of age are less likely to be underweight or shorter than the 50th percentile of height for their age, and therefore less likely to be malnourished, than infants in whom weaning is started at 6 months of age or later.

Novelty Statement | This study not only reflects upon the status of nutrition among infants in the lesser developed districts of Pakistan but also analyzes the pros and cons of adherence to WHO guidelines regarding infant nutrition in this part of the world.

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Introduction

Weaning is the term commonly used for introduction of semi-solid or solid foods in the diet of an infant

who has been hitherto fed breast milk or formula milk only (Vail *et al.*, 2015). This is an important transition in the diet of the child. The WHO guidelines about the timing of this dietary transition have varied in the past. Previously, WHO recommended weaning to be started at 4-6 months of age. The current guidelines recommend 6 months as the age at which weaning should be started. While the

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American Academy of Pediatrics and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition generally support the WHO recommendations about infant nutrition, they also suggest that the age at which weaning may vary from 4-6 months, and must be comprehensively determined by the child's achievement of certain developmental milestones (Eidelman, 2012).

However, the weaning practices vary greatly among different countries and localities, depending on the cultural norms and socioeconomic factors (Dewey, 2020). These weaning practices may contribute to malnutrition in infancy, due to either deficiency of total calories or imbalance of the nutrients being given. Standard indicators of growth that may reflect nutritional status in infancy include weight and height as compared with the WHO growth charts (Udoh and Amodu, 2016). According to UNICEF, nearly 10 million children in Pakistan suffer from growth stunting (Nutrition, 2020).

Rationale of this study was to determine if any correlation exists between the age at which weaning is started with malnutrition in infants in Pakistan, as indicated by growth stunting. Finding such an association will not only aid in educating the masses but also in updating local and national child health policies regarding appropriate weaning practices, thereby decreasing the prevalence of malnutrition and growth stunting among infants.

The aim of the study is to find out association of malnutrition in infants with the age at which weaning was started.

Materials and Methods

It was a cross-sectional, observational study, conducted in Pediatric Medicine Department of District Headquarter Hospital, Chakwal, Pakistan, from January 2020 to February 2020. All 200 infants, visiting the Pediatric Medicine Department, both male and female, up to 1 year of age, were included in the study. Infants who were born premature or had congenital diseases were excluded from the study. Informed consent was taken from the accompanying parent or guardian of each infant. Investigators questioned the consenting parent or guardian about the demographic details and the weaning practices of the infant, focusing on the age at which regular weaning was started in each infant, particularly whether weaning was started before the age of six months or at or after the age of six months. Weight and height of infants, which are considered as two of the indicators of nutritional status in infancy, were also recorded. For this purpose, adhering to the WHO Child Growth Standards (WHO Int., 2020) each child was weighed in kilograms using the standard pediatric weighing machine available

at the Pediatric Medicine department. Similarly, the infant's height was also measured in centimetres according to the standard protocol. The weight and height were compared with the WHO weight-for-age and height-for-age (Length/height-for-age: Child growth standards) percentile Growth Charts, respectively. Children that had weight less than the 50th percentile on the weight-for-age growth chart were labelled as underweight. Infants with height less than the 50th percentile on the height-for-age growth chart were labelled as shorter than was normal for their age. Underweight children and infants who were shorter than was normal for their age were considered malnourished. Data was entered in SPSS version 26 and data was analysed using cross-tabulation for association between the age at which weaning was started and the prevalence of malnutrition. $P < 0.05$ was considered statistically significant.

Results

A total of 200 infants presented to the Pediatric Medicine Department of DHQ Hospital Chakwal were included in the study, of which 94 (47%) of infants were less than 6 months old, and 106 (53%) were 6-12 months old. Minimum age of infant in study was 4 months and maximum 12 months. Mean age of child was 6.96 months \pm 2.179 SD. 102 infants (51%) were male and 98 (49%) were female. 79.5% of infants under study were currently being breast fed and 20.5 % were not receiving breast milk at the time of study. 113 (56.5%) infants under study were started weaning at less than 6 months of age and 87 (43.5%) infants were started weaning at 6 months of age or later. Out of 113 infants whose weaning was started at less than 6 months of age, 58 (51.3%) were found to be underweight for their age (Table 1) and 29 (25.7%) were shorter than the 50th percentile for their age (Table 2). Of the 87 infants whose weaning was started at 6 months of age or later, 54 (62.1%) were underweight for their age (Table 1) and 23 (26.4%) were shorter than the 50th percentile for their age (Table 2).

Table 1: Cross tabulation between weaning age and underweight child.

Weaning started at age * underweight child crosstabulation					
		Num- ber of infants	Number of un- derweight infants		Total
			Yes	no	
Weaning started at age:	less than 6 months	113	58 51.3%	55 48.7%	113 100.0%
	at and greater than 6 months	87	54 62.1%	33 32.4%	71 100.0%
Total		200	112 56.0%	88 44.0%	200 100.0%

Table 2: Cross tabulation between weaning age and stunting child.

		Weaning started at age * stunting crosstabulation			
		Number of infants	Stunting		Total
	Yes		no		
Weaning started at age:	less than 6 months	113	29 25.7%	55 48.7%	113 100.0%
	at and greater than 6 months	87	23 26.4%	33 32.4%	71 100.0%
Total		200	112 56.0%	88 44.0%	200 100.0%

Discussion

Malnutrition in infancy can have severe and long-lasting impacts on the health of the individual (Bandara *et al.*, 2014). According to a study, pediatric malnutrition is the single biggest contributor to child mortality (Lui *et al.*, 2016). Recognising the gravity of the situation, WHO has developed and regularly updated detailed recommendations regarding the feeding practices of infants in order to decrease the global prevalence of malnutrition among children, in general, and infants, in particular. These guidelines bring into account a variety of factors that affect the nutritional status of infants (Dewey, 2020). One such factor that has been much debated-upon in the past few decades is the age at which weaning must be started. Previously, WHO guidelines recommended 4-6 months as the age at which weaning must be started. The current guidelines, however, recommend 6 months as the age at which weaning must ideally be started. However, the age at which weaning is started greatly varies depending on various factors such as the educational status of the parent, socio-economic class of the family and the cultural beliefs and practices (Henry, 2019).

This study was conducted in the Pediatric Medicine Department of the District Headquarter Hospital of Chakwal, one of the smaller districts of Punjab, the largest province of Pakistan. This district has a higher literacy rate of 72.2% than the overall literacy rate of the province of Punjab which is 59.3%, according to the Multiple Indicator Cluster Survey of Punjab, Pakistan¹². Similarly, Chakwal also has lesser ratio of malnourished children as compared to the overall prevalence of pediatric malnourishment in the province of Punjab; 24.4% of children in Chakwal are underweight for their age, while 33.6% of children are underweight for their age in Punjab, overall (Multiple Indicator Cluster Survey, 2020). However, the statistics for pediatric malnourishment in the district of Chakwal are much closer to the current statistics for Pakistan; currently, 23% of children in Pakistan are underweight for their age (Prevalence of underweight, weight for age (% of children under 5)). Therefore, the results calculated and

the conclusions drawn from the study may be confidently applied for developing and updating policies related to child health and nutrition not only at a local level but also at a national level. In Pakistan, the nutritional level of mothers is generally poor; one in two mothers in Pakistan is anemic due to lack of iron (Khan, 2010). Therefore, exclusive breastfeeding in infants beyond 4 months of age may not be as advantageous for the health and growth of infants as it is in countries with better maternal health status. While the benefits of continued breastfeeding till 2 years are irrefutable and must be advocated as such, in countries with poor maternal health status it may prove beneficial for the growth and health of infants to start age-appropriate weaning between the age of 4 to 6 months, as indicated by the results of our study.

Since this study was conducted in the Pediatric Medicine Department of a hospital, no distinction was made between infants on the basis of the purpose for which they visited the hospital. Therefore, no infants were excluded on the basis of disease except those suffering from congenital diseases or those born prematurely. So, some children might have presented to the Pediatric Medicine Department with acute weight loss owing to conditions that cause dehydration and acute weight loss such as diarrhea. However, all children included in the study were vitally stable and so, were less likely to have moderate or severe dehydration that can cause more than 5% weight loss (Vega and Avva, 2020). Similarly, other causes of weight loss in children were also not excluded. However, the other parameter used in this study for indicating malnutrition, height-for-age, is not affected by acute medical conditions.

Conclusion

Children in which weaning is started before 6 months of age are less likely to be malnourished as they are less likely to be underweight or shorter than the 50th percentile of height for their age than infants in whom weaning is started at 6 months of age or later.

Conflict of interest

The authors have declared no conflict of interest.

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