Prevalence and correlates of acute respiratory infections in children less than two years of age

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ABSTRACT

Objectives: To study acute respiratory infections of children less than 2 years of age in Riyadh City and their sociodemographic and anthropometric correlates.

Methods: Study subjects included 250 mothers selected by systematic random sampling from mothers attending 5 Primary Health Care Centers selected by simple random sampling from the 5 geographical zones (one from each zone) in Riyadh during a one month period. Data was collected via a structured pilot tested modified questionnaire filled in by trained research assistants who interviewed mothers regarding acute respiratory infections during the past 2 weeks in their children aged less than 2 years. Heights and weights of both children and mothers were measured and the necessary sociodemographic characteristics of the mothers, and children were collected by the research assistants in addition to mothers' practices concerning their childs' acute respiratory infections.

Results: The prevalence of acute respiratory infection in children was 24%, mostly in children whose mothers are less educated, aged 35 years or more, married at age 25 years or more and whose relatives take care of their children while working outside the home. The children affected were mostly 7 - 12 months of age, lighter in weight, not vaccinated, with no follow up cards and not weighed during the last 4 months. About 3 quarters of the mothers consulted somebody about acute respiratory infections, mostly at modern health facilities particularly government Primary Health Care Centers. Tachypnea, or diarrhea or both were the most important symptoms urging mothers to seek medical advice. Working mothers whose children are taken care of by relatives is the only significant predictor of acute respiratory infections, and children with a follow up card is the only significant predictor for consulting somebody about acute respiratory infections.

Conclusion: Intervention strategies to control acure respiratory infections in children less than 2 years of age should target working mothers, less educated mothers, malnourished unvaccinated children and encourage periodic follow up visits for children.

Keywords: Acute respiratory infections, children, socio-demographic characteristics.

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Health interview surveys have become an increasingly common source of information regarding morbidity patterns in many countries including developing ones. For young children, maternal health interview surveys are widely used to estimate the prevalence of different morbidity patterns in many developing countries.[1] Studies showed a highly significant association between maternal reports of illness in their children and the biochemical profile of their children's health which appears to suggest the validity of such interviews,[2] although there is room for improvement and modifications to make them more useful in providing accurate data at low cost.[3] Acute respiratory

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infections (ARI) in children are a major cause of morbidity and mortality in many developing countries.[4,5] Studies reported variable prevalences of ARI ranging from 3-30%[6-8] and incidence of episodes ranging from 2.8 to 7.2 per 100 children per year.[7,9-11] The 1990 World Summit for Children has set a 33% reduction in ARI by the year 2000.[12] These objectives seem far from being achieved. In Saudi Arabia, ARI is unrivalled by any other morbidity in children.[13] Physicians working in Primary Health Care Centers (PHCCs) estimated that ARI was the cause of sickness in 50% of all children under 5 years of age,[14] and a hospital-based study found that complaints suggestive of ARI are common in children with 37% being of viral etiology.[15] The present study attempts to estimate the prevalence of ARI morbidity in children less than 2 years of age in Riyadh City, the Capital of Saudi Arabia, the factors associated with such morbidity and actions taken as reported by mothers of children. Such information is vital to control morbidity and its sequelae in children.

Methods. The subjects included all children aged 24 months or less at the time of the study. The mothers of those children were interviewed regarding ARI infections in their children during the past 2 weeks. Sociodemographic and anthropometric data about the mothers and their children were also collected. The subjects (50 from each center) were chosen by systematic random sampling from records in 5 PHCCs in Riyadh city which offer free services to all Saudi citizens and eligible expatriates. The PHCCs themselves were selected by simple random sampling from the 5 regional zones in Riyadh City (one PHCC from each zone). Data was collected by trained students in the Nutrition Program of the College of Applied Medical Sciences of King Saud University, Riyadh. Collected data was checked for completeness before entry into a personal computer. Data analysis was carried out using SPSS program. In addition to the usual descriptive statistics, chi square was used to study associations of ARI episodes with the sociodemographics and anthropometrics of the subjects and multiple regression was performed to study predictor factors for morbidity and actions taken for it.

Results. Of the total 250 subjects interviewed, 16 (6%) were excluded from final analysis due to various deficiencies in their records. The overall child morbidity as reported by mothers during the past 2 weeks was 24% for ARI. Table 1 profiles morbidity according to the different variables studied which included sociodemographics and some nutritional aspects of both child and mother. As can be seen for ARI in children, the mothers were mostly non Saudis, aged less than 35 years and married at age less than 25 years, with 2 - 6 years of schooling, with relatives taking care of their children if they work outside the home. The affected children themselves were aged 7 - 12 months, with no follow up card, not weighed during the past 4 months, not vaccinated, with current weight less than 6 kilograms, and height ranging from 35 - 70 centimetres. The differences are only significant for child height, and when relatives take care of the child for the working mother. About 71% of the mothers consulted somebody about the ARI episodes of their children and this was significantly associated with working mothers, years of schooling, mother's age at marriage, child's age, weight and vaccination as can be seen in Table 1. The mothers looked for advice primarily in government PHCCs (44%), hospitals (23%), private health facilities (22%), relatives or friends (5%), private pharmacy (2%) traditional healers, and others accounted for 4%. No significant differences were found according to the socio-demoanthropometric variables studied. Multiple linear regression was performed to detect predictor variables of episodes of ARI in children and of mothers tendency to consult somebody about their children's diarrhea. Only working mothers whose children are taken care of by their relatives have a significantly higher number of ARI episodes in their children. All other variables were not significant predictors of child morbidity. Children with follow up cards is the only significant predictor of mothers seeking consultation from others about their child's ARI episodes. All other variables were not significant predictors. The most important child symptoms urging mothers to seek medical help are rapid respiratory rate or diarrhea, or both (60%), anorexia (20%) and fever 3%.

Discussion. Acute respiratory infections are major causes of morbidity and mortality in many societies particularly developing countries. For any control measure, accurate and adequate information about the incidence, prevalence and the epidemiological, environmental and socio-demographic factors associated need to be collected and carefully interpreted. The results of our study show that nearly a quarter of children less than 2 years of age in Riyadh city suffered at least one episode of ARI during a 2 week period as reported by their mothers. Previous studies in the Kingdom reported a prevalence approaching 50%.[14] Studies in other countries reported very variable magnitudes of ARI in children ranging from 22 - 30% in Pakistan and Syria[6,7] to less than 3% in Ethiopia[8] in children less than 5 years despite the countries being classified as poor developing countries. Other studies reported morbidity as incidence of episodes of ARI ranging from 2.8 episodes per 100 children per year to 5.7 - 7.2,[7,9-11] while others reported episodes of ARI qualitatively as the most common morbidity in children,[4,5] thus making comparative analysis very

Table 1 - Episodes of acute respiratory infections and whether mother consulted someone, according to subjects' sociodemoanthropometric characteristics.

Subjects' characteristics	ARI Episodes (%)	P-Value	Mother consulted somebody (%)	P-Value
Nationality				
Saudi mother	22.0	0.724	69.0	0.358
Non Saudi mother	25.0		79.0	
Mothers' Education				
Literate mother	23.0	0.546	70.0	0.838
Illiterate mother	25.0		73.0	
Mothers' Employment				
Working mother	23.0	0.884	85.0	0.040
Non working mother	24.0		64.0	
Who cares for the child during work				
Takes child with me	20.0	0.017	75.0	0.147
Relatives	52.0		67.0	
Friends/Neighbours	25.0		75.0	
Housemaid	14.0		93.0	
Nursery	12.5			
Years of schooling				
2 - 6	37.0	0.099	50.0	0.019
7 - 12	21.0		71.0	
13+	28.0		35.5	
Age of mother				
18 - 24	25.0	0.798	65.5	0.468
25 - 34	23.0		70.0	
35+	29.0		79.0	
Mothers age at marriage				
12 - 18	25.0	0.723	75.0	0.024
19 - 24	22.0		61.5	
25+	30.0		95.0	
Child age in months				
1 - 6	20.0	0.503	49.0	0.006
7 - 12	31.0		77.0	
13 - 18	24.0		82.5	
19 - 24	21.0		72.0	
Child weight in kilograms				
0.5 - 5.9	36.0	0.555	58.0	0.043
6.0 - 10.9	25.5		68.0	
11.0 - 14.9	30.0		84.0	
15.0 - 19.5	27.0		93.0	
Child height in centimetres				
10 - 35	18.0	0.005	87.0	0.442
36 - 49	44.0		75.0	
50 - 70	43.0		63.0	
71 - 99	12.5		71.0	
Child vaccinated				
Yes	23.0	0.555	72.0	0.040
No	37.5		17.0	
Child has vaccination card				
Yes	24.0	0.574	70.0	0.790
No	25.0		73.0	
Child has follow up card				
Yes	23.0	0.590	73.0	0.119
No	31.0		59.0	
Child weighed during past 4 months				
Yes	22.0	0.061	72.0	0.917
No	34.0		71.0	

ARI - Acute respiratory infection

difficult if not invalid. The results of our study revealed no significant association between episodes of ARI and the sociodemographic and anthropometric variables studied, except for child height and in children taken care of by relatives during their mothers work outside the home. Breast feeding was not significantly associated with morbidity in contradiction to findings of most studies which found that ARI are more common in non breast fed children.[16-19] Crowding and living in rural areas and cold weather were the most important risk factors for ARI in some studies,[8,9,20] and lack of immunization, low birth weight were not associated with ARI.[21] Other studies suggested that immunization, adequate nutrition, breast feeding and environmental sanitation were the most important control strategies.[12] The most vulnerable group were children aged 6 - 11 months[5,7,9,15,22,23] as we found in the present study. As for gender, boys were more affected than girls.[9,10] Findings of our study did not reveal any similar pattern of association. Lower level of parents' education was associated with higher morbidity,[8,24] and mothers with lower educational levels tend to have children with more ARI as in our study, although the differences are not statistically significant. In our study, multiple regression analysis did not reveal any statistically significant predictors of ARI infections in children. Other studies showed that in addition to decreased child weight for age, routine use of contaminated water, vitamin A deficiency and lack of breast feeding were significant predictors of increased duration for ARI.[25] It is gratifying that the majority of mothers contact health services for sickness episodes, and these health services were mostly government PHCCs which are the appropriate first contact facilities. Some studies reported that mothers contacted health facilities for only one third to half the sickness episodes in their children.[26,27] A national protocol for diagnosis and treatment of ARI has been prepared and distributed. Leaders of primary health care, and 55 national trainers have been trained as part of the overall strategy for the national control program of ARI in children.[14]

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