

Oral lesions and dental status among institutionalized orphans in Yemen: A matched case-control study

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Abstract

Objectives: The aim of this study was to assess the prevalence of oral mucosal lesions (OMLs) and dental caries and to evaluate oral health practices among institutionalized orphan-children in Sana'a city, Yemen. **Subjects and Methods:** A sample of 202 institutionalized male-orphan-children in the main orphanage in Sana'a city, were matched to 202 non-orphan schoolchildren. Clinical examination included assessment of OMLs based on standard international diagnostic criteria and evaluation of dental status using the Decayed/decayed, Missed/missed and Filled/filled (DMFT/dmft) index according to World Health Organization recommendations. Demographic data and oral hygiene practices were obtained by interviewing each subject using special questionnaire form. **Results:** Majority of children were in the 12-15 year age group. Nine types of lesions were reported among orphans; the most common lesions were fissured tongue (24.3%), herpes labialis (7.9%) and traumatic ulcers (2.5%). The occurrence of herpes labialis was found to be significantly higher in orphans than in controls ($P < 0.01$). The prevalence of dental caries was insignificantly lower among the orphans (84.7%) compared with the non-orphans (89.61%; $P = 0.136$). The mean dmft score was significantly lower in orphans than in controls (2.28 vs. 3.82; $P = 0.001$). **Conclusions:** The institutionalized children in this orphanage had a high prevalence of OMLs but low prevalence of dental caries, though they revealed poor oral hygiene practices. Effective oral health promotion strategies need to be implemented to improve the oral health and oral health practices of children living in orphanages.

Keywords: Dental caries, institutionalized orphans, oral lesions

Introduction

An orphan is defined as a child under 18 years who has lost his father, mother or both parents. Orphans, therefore, are considered disadvantaged and socially marginalized population whom diseases burden is high.^[1] Poor living conditions in orphanages where children live might be related to many complex health problems.

Regarding oral health, children in orphanages revealed a high prevalence of dental caries,^[2] dental trauma and gingivitis.^[3] This has been attributed to overcrowding, lack of adequate

staff, poor oral health practices, psychological stress and improper dietary habits.^[4]

However, the assessment of oral and dental health among orphan population is scarce. Therefore, this study was planned to assess the prevalence of oral mucosal lesions (OMLs) and dental status among the institutionalized orphan-children in Yemen.

Subjects and Methods

This case-controlled study involved 202 institutionalized male-orphan children and 202-age and sex matched non-orphan schoolchildren as controls. The institutionalized orphans were recruited from the main orphanage in Sana'a city (Al-Shawkani orphanage). Controls were randomly selected from one public school in the same neighborhood. Children, in both groups, with any kind of disability or systemic disease were excluded from the study.

This study was approved by the Research and Ethics Committee, Faculty of Medicine and Health Sciences, Sana'a University, Yemen. All children were informed about the study methods and purposes and consents were obtained from relevant authorities and the participants' parents/guardians for non-orphans.

An interview questionnaire was filled out for each child; data such as age, educational status, patterns of oral hygiene practices, dietary habits and history of professional dental care were recorded.

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Oral examination was conducted for both orphans and controls by a single examiner (Al-Maweri, SA). Extra- and intra-oral examination was performed using electrical overhead light, mouth mirror, tweezers, dental explorer, gauze and wooden tongue depressor. OMLs were evaluated using standard international diagnostic criteria.^[5] Dental status was evaluated using Decayed/decayed, Missed/missed and Filled/filled (DMFT/dmft) index according to the World Health Organization oral health surveys.^[6]

SPSS (SPSS Inc., IL, Chicago, USA) version 19.00 was used for data entry and analysis. Qualitative data were presented as frequencies and percentages, while quantitative data were presented as means and standard deviations. Chi-square test and Mann Whitney's U-test were used, as appropriate, to determine differences between groups. A $P < 0.05$ was considered to be statistically significant.

Results

Mean ages were comparable. It was 11.62 ± 2.13 years for orphans and 11.48 ± 2.112 years for the control group. Majority of children in both groups were in the 12-15 year age group. The demographic characteristics of both groups are presented in Table 1.

Most of the children reported poor oral hygiene practices; only 56 (27.7%) orphans and 37 (18.4%) non-orphans reported to have been cleaning their teeth at least once a day ($P < 0.001$). The most commonly used cleaning tool among orphans was finger (32.7%) followed by toothbrush (17.3%) and siwack (6.9%); in contrast, toothbrush was the most commonly used cleaning tool among non-orphans (63.4%) followed by siwak (6.4%) and finger (1.5%). This difference was statistically significant $P < 0.001$ [Table 2].

Nine types of OMLs-conditions were diagnosed among orphans. The most common lesions were fissured tongue (24.3%), herpes labialis (7.9%), traumatic ulcers (2.5%) and geographic tongue (2.5%). The occurrence of herpes labialis was significantly higher in orphans than in controls [$P < 0.01$; Table 3].

The prevalence of traumatic teeth was significantly higher among the orphans (9.9%) than the non-orphan controls [2.5%; $P < 0.01$; Table 4].

Table 5 presents mean scores of DMFT and dmft for both groups. The mean scores of DMFT were 2.06 ± 1.94 and 1.77 ± 1.58 for orphans and control, respectively, with no significant difference ($P > 0.05$). On the other hand, orphans had significantly lower mean dmft scores (2.28 ± 2.37) compared with controls (3.82 ± 2.57 ; $P < 0.001$).

Discussion

To the best of our knowledge this is the first study undertaken to evaluate OMLs along with dental health

status among the institutionalized orphans utilizing control subjects.

In this study, the orphan children showed poor oral hygiene practices. Of total, only 35 (17.3%) reported using the toothbrush for cleaning their teeth, which was significantly lower when compared with controls (63.4%; $P = 0.001$). This result is also in contrast to a recent study conducted by Khare *et al.*^[7] on institutionalized orphans in India in which 45% reported using toothbrush for cleaning their teeth. Further, Kahabuka and Mbawalla^[8] in their study on institutionalized street children in Dar Al-Salam, Tanzania

Table 1: Age and type of dentition of the study subjects

Charcteristics	Orphans $n=202$		Non-orphans $n=202$		P value
	N (%)	Mean (SD)	N (%)	Mean (SD)	
Age group (years)					
6-8	28 (13.9)	11.62 (2.13)	31 (15.3)	11.48 (2.11)	NS
9-11	52 (25.7)		53 (26.2)		
12-15	122 (60.4)		118 (58.4)		
Type of dentition					
Mixed	123 (60.9)		136 (67.3)		NS
Permanent	79 (39.1)		66 (32.7)		

SD: Standard deviation, NS: Non-significant

Table 2: Oral hygiene practices of study subjects

Charcteristics	N=202		P value
	Orphans	Non-orphans	
Teeth cleaning			
Never	89 (44.1)	53 (26.2)	0.000
Irregular	57 (28.2)	112 (55.4)	
Once/day	17 (8.4)	28 (13.9)	
At least twice/day	39 (19.3)	9 (4.5)	
Cleaning tool			
None	87 (43.1)	55 (27.2)	0.000
Finger	66 (32.7)	3 (1.5)	
Brush	35 (17.3)	128 (63.4)	
Siwak	14 (6.9)	13 (6.4)	
Others		3 (1.5)	
Sweets intake			
Rarely	64 (31.7)	51 (25.2)	0.016
Sometimes	125 (61.9)	121 (59.9)	
Always	13 (6.4)	30 (14.9)	
Chi-square test			

Table 3: Prevalence of oral mucosal lesions among orphans and controls

Oral lesions	n=202 N (%)		P value
	Orphans	Non-orphans	
Fissured tongue	49 (24.3)	54 (26.7)	NS
Geographic tongue	5 (2.5)	3 (1.5)	NS
Hairy tongue	3 (1.5)	2 (1)	NS*
Atrophic tongue	1 (0.5)	3 (1.5)	NS*
Traumatic ulcer	5 (2.5)	2 (1)	NS*
Aphthous ulcer	1 (0.5)	2 (1)	NS*
Herpes labialis	16 (7.9)	3 (1.5)	0.004
Cheek biting	5 (2.5)	3 (1.5)	NS*
Nevous	1 (0.5)	0	NS*
Fistule	8 (4.0)	7 (3.5)	NS

Chi-square test, *Fisher exact test. NS: Non-significant

Table 4: Proportion of caries-free and traumatic teeth in both groups

Variables	Orphans (%)	Non-orphans (%)	P value*
Caries free	31 (15.3)	21 (10.4)	0.137
Traumatic teeth	20 (9.9)	5 (2.5)	0.02

*Chi-square test

Table 5: Comparison of DMFT and dmft mean scores and their components between orphans and controls

Variable	Orphans		Non-orphans		P value**
	Mean	SD	Mean	SD	
DMFT	2.06	1.94	1.77	1.58	NS
D	1.95	1.82	1.73	1.55	NS
M	0.02	0.16	0.02	0.16	NS
F	0.09	0.35	0.00	0.00	0.001
dmft	2.28	2.37	3.82	2.57	0.001
d	2.09	2.22	3.43	2.46	0.001
m	0.06	0.29	0.21	0.57	0.001
f	0.13	0.42	0.09	0.56	0.02

**Mann-Whitney U-test, NS: Non-significant; SD: Standard deviation; DMFT/dmft: Decayed/decayed, missed/missed and filled/filled index

found that around 92% of the subjects reported brushing their teeth.

Nine oral lesions were noticed among the study subjects. The most common prevalent lesions were fissured tongue, recurrent herpes labialis, traumatic ulcers and geographic tongue. The prevalence of herpes labialis was significantly higher among orphans (7.9%) than controls (1.5%; $P = 0.001$). This rate is also higher than that reported in previous studies elsewhere.^[9-13] It is also worth mentioning that the reported prevalence of herpes labialis among schoolchildren in the US ranged between 0.78%^[9] and 1.42%.^[12] In addition, a high

point prevalence rate of 2.9% was reported by Parlak *et al.*^[14] in a study based on 13-16-year-old students in an earthquake stricken region of Turkey. In a recent study in Iran, herpes labialis was reported in 0.4% of 12-15 year old students.^[13] Many factors may explain the higher prevalence of herpes labialis among institutionalized orphans in this study: Low socio-economic status, overcrowding in the orphanage, lack of personal hygiene habits, malnutrition and psychological stress among the orphans. In their study Ambika *et al.*^[15] and Crivelli *et al.*^[16] reported that children with diagnosed herpes labialis were of lower socio-economic background.

The prevalence of fissured tongue was comparable in both groups. The prevalence of this condition varies by geographic location and has been reported to vary from as low as 0.6% in South Africa^[17] to as high as 30.6% in Israel.^[18] Tongue fissuring is suggested to be genetically determined and this could be the reason for such prevalence variability world-wide.^[19]

Prevalence of traumatic ulcers was also higher in orphans than controls (2.5% vs. 1%); however, the difference was not statistically significant. A similar result was reported among 4-14 year old children in India.^[15] Such ulcers may be caused by direct physical/mechanical, thermal or chemical trauma.

The present study revealed higher prevalence of traumatic teeth among orphans compared with controls ($P < 0.01$). Similar finding was reported among institutionalized orphans in India.^[7] This is perhaps due to overcrowding in the orphanage and the psychological stress to which the orphans are subjected. In fact, the orphans spend more time (the whole day) in physical contact with each other in an overcrowding environment compared with the controls. In addition, the psychological stress may increase the violence between children.

In the present study, the prevalence of dental caries in orphans was 84.7%, which is lower than non-orphan controls (89.6%), though the difference was insignificant. This result is in accordance with a study conducted by Seow *et al.*^[20] who reported a prevalence rate of 78% among aboriginal children. However, the figure reported in the current study is two-fold higher than that reported among the institutionalized orphans in India,^[7] Iran^[21] and Saudi Arabia.^[22] Moreover, in a study on orphans in Romania, the majority of children under and over the age of 6 years (97%, 86% respectively) were caries free.^[3]

The mean dmft was significantly lower in orphan children (2.28) than in non-orphan controls (3.82; $P = 0.0001$). By and large, it is accepted that institutionalized children tend to be less susceptible to caries attack than the general population.^[3,7,22] Contrarily, Dixit *et al.*^[2] reported higher mean scores of dmft/DMFT in orphans than in the general population. Low prevalence of dental caries among the institutionalized orphans compared with controls can be

partly attributed to non-cariogenic daily diet and lack of sugary snacks between main meals in the orphanages, when compared with children living with their families [Table 2].

Unfortunately, the decay component in this study accounted for a fraction of 92% of DMFT/dmft score. This fact highly reflects that these children have poor access to restorative dental care and/or a negligible sign of preventive care. There are many factors contributing to the high percentage of untreated carious lesions among underprivileged orphan population; lack of knowledge about good oral hygiene practices among caretakers and concerned authorities, lack of motivation, low priority given to dental care in society, lack of the facility for early and regular oral health check-up and prompt treatment and cost of treatment are among these factors.

It was surprising to find more filled teeth among the orphan children compared with their controls. Such a result can be attributed to the limited services provided by some charities and private dental clinics for the underserved institutionalized people. However, this result reveals negligible care of the parents in treating the carious teeth of their children.

Conclusions

Our study found a high prevalence of OMLs, poor oral hygiene practices, but lower prevalence of dental caries among orphans when compared with non-orphan school children. There is an apparent need for dental health programs to target the institutionalized orphans in particular and school children in general in order to improve their oral health status and prevent oral diseases.

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References

- Petersen PE. The World Oral Health Report 2003: Continuous improvement of oral health in the 21st century – The approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol* 2003;31 Suppl 1:3-23.
- Dixit S, Chaudhary M, Singh A. Molluscum contagiosum and dental caries: A pertinent combination. *J Indian Soc Pedod Prev Dent* 2009;27:197-201.
- O'Sullivan EA, Stephens AJ. The oral and dental status of children residing in a Romanian orphanage. *Int J Paediatr Dent* 1997;7:41-2.

- Muralidharan D, Fareed N, Shanthi M. Comprehensive dental health care program at an orphanage in Nellore district of Andhra Pradesh. *Indian J Dent Res* 2012;23:171-5.
- Kramer IR, Pindborg JJ, Bezroukov V, Infirri JS. Guide to epidemiology and diagnosis of oral mucosal diseases and conditions. World Health Organization. *Community Dent Oral Epidemiol* 1980;8:1-26.
- WHO. Oral Health Surveys: Basic Methods. 4th ed. Geneva: World Health Organization; 1997.
- Khare V, Koshy A, Rani P, Srilatha S, Kapse SC, Agrawal A. Prevalence of dental caries and treatment needs among the orphan children and adolescents of Udaipur district, Rajasthan, India. *J Contemp Dent Pract* 2012;13:182-7.
- Kahabuka FK, Mbawalla HS. Oral health knowledge and practices among Dar es Salaam institutionalized former street children aged 7-16 years. *Int J Dent Hyg* 2006;4:174-8.
- Kleinman DV, Swango PA, Pindborg JJ. Epidemiology of oral mucosal lesions in United States schoolchildren: 1986-87. *Community Dent Oral Epidemiol* 1994;22:243-53.
- Reichert PA. Oral mucosal lesions in a representative cross-sectional study of aging Germans. *Community Dent Oral Epidemiol* 2000;28:390-8.
- Garcia-Pola MJ, Garcia-Martin JM, Gonzalez-Garcia M. Prevalence of oral lesions in the 6-year-old pediatric population of Oviedo (Spain). *Med Oral* 2002;7:184-91.
- Shulman JD. Prevalence of oral mucosal lesions in children and youths in the USA. *Int J Paediatr Dent* 2005;15:89-97.
- Jahanbani J, Morse DE, Alinejad H. Prevalence of oral lesions and normal variants of the oral mucosa in 12 to 15-year-old students in Tehran, Iran. *Arch Iran Med* 2012;15:142-5.
- Parlak AH, Koybasi S, Yavuz T, Yesildal N, Anul H, Aydogan I, *et al.* Prevalence of oral lesions in 13- to 16-year-old students in Duzce, Turkey. *Oral Dis* 2006;12:553-8.
- Ambika L, Keluskar V, Hugar S, Patil S. Prevalence of oral mucosal lesions and variations in Indian public school children. *Braz J Oral Sci* 2011;10:288-93.
- Crivelli MR, Aguas S, Adler I, Quarracino C, Bazerque P. Influence of socioeconomic status on oral mucosa lesion prevalence in schoolchildren. *Community Dent Oral Epidemiol* 1988;16:58-60.
- Arendorf TM, van der Ross R. Oral soft tissue lesions in a black pre-school South African population. *Community Dent Oral Epidemiol* 1996;24:296-7.
- Yarom N, Cantony U, Gorsky M. Prevalence of fissured tongue, geographic tongue and median rhomboid glossitis among Israeli adults of different ethnic origins. *Dermatology* 2004;209:88-94.
- Kullaa-Mikkonen A, Sorvari T, Kotilainen R. Morphological variations on the dorsal surface of the human tongue. *Proc Finn Dent Soc* 1985;81:104-10.
- Seow WK, Amaratunge A, Bennett R, Bronsch D, Lai PY. Dental health of aboriginal pre-school children in Brisbane, Australia. *Community Dent Oral Epidemiol* 1996;24:187-90.
- Mazhari F, Ajami B, Ojrati N. Dental treatment needs of 6-12-year old children in Mashhad orphanages in 2006. *J Mashhad Dent Sch* 2008;32:81-6.
- Al-Malik M, Holt RD. The prevalence of caries and of tooth tissue loss in a group of children living in a social welfare institute in Jeddah, Saudi Arabia. *Int Dent J* 2000;50:289-92.

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