PREVALENCE OF GINGIVITIS AMONG HIV POSITIVE ORPHANS AT A NAIROBI CHILDREN'S HOME

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A research proposal submitted for partial fulfillment of bachelor of dental surgery degree.
LIST OF ABBREVIATIONS
BDS - Bachelor of Dental Surgery
MPH - Masters in Public Health
HIV - Human Immunodeficiency Virus
AIDS - Acquired Immune Deficiency Syndrome
WHO - World Health Organisation
NGO's - Non Governmental Organisation
Ksh – Kenya Shillings
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SUMMARY

HIV/AIDS children have an impaired immune system.

Gingivitis is an inflammatory disease thus is likely to be higher in HIV children compared with normal children.

A descriptive cross-sectional study will be carried out to determine the prevalence and severity of gingivitis among HIV positive children, at a children's home in Nairobi. A total of 76 children of both sexes aged between 2 - 15 years will be examined. A semi-structured data collection form was used to collect data. The plaque score and gingival index of each child will be recorded.

Not many studies have been conducted on HIV positive children in Kenya. This study will be aimed to determine whether the prevalence of gingivitis in HIV positive children's greater or not than that of normal children.

Thus more studies should be carried out on different aspects of the oral status of poor underprivileged children, to find out the magnitude of oral manifestations of this yet incurable disease.
INTRODUCTION

Gingivitis is the inflammation of the gingivae and hardly ever affects deeper tissues of periodontium. It is usually painless and asymptomatic. Previous studies have shown the prevalence of gingivitis in Kenyan children to be 37%. Masiga MA et.al (2), Ohito FA et.al (3)

In 1995, HIV prevalence in Kenya (Age 15+) as surveyed by Kenya Aids NGO’s consortium (4) was 1,030,627. However, according to the UNAIDS/WHO epidemiological fact sheet updated in 2000 (5), the following statistics were shown in Kenya as at the end of 1999. Total HIV prevalence was 2,100,000, number of HIV children 0-14yrs was 78,000, Cumulative HIV positive orphans were 730,000. This shows an almost two fold increase in the prevalence of HIV/AIDS in 4 years.

Periodontal disease may be the first clinical sign of HIV infection. The periodontal diseases in HIV seropositive patients include HIV gingivitis, necrotic ulcerative gingivitis and HIV periodontitis. The new term for HIV Gingivitis and HIV Periodontitis is linear gingival erythema and Necrotizing ulcerative periodontitis respectively.

A study carried out by C.M. Masouredis et al (6) showed prevalence of HIV gingivitis on 136 patients to be 58%, showing high prevalence of HIV gingivitis.

According to a recent Nyumbani home pamphlet (7), it is estimated that there are 150,000 HIV positive children in Kenya today with a still rising incidence. Tragically most HIV positive mothers assume that their child will not live and are usually abandoned. Such infants at birth all test positive due to the presence of natural antibodies in their bloodstream, but only one in four is actually infected, according to statistics. It is not until several months later that three out of four turn negative. The care (especially oral health care) of these children with an, as yet incurable disease may not seem necessary to parents or guardians of these children, as other HIV related problems may surpass or undermine their need of oral health care. These guardians or parents may lose the zeal or
motivation to maintain good oral health care of these children. This should not be the case since HIV gingivitis is preventable through good oral hygiene measures.

With an ever increasing number of HIV orphans, a long lasting community effort must be engaged in caring for these voiceless, vulnerable children
LITERATURE REVIEW

Although no definitive study of this sort has been carried out in Kenya, it is known that the prevalence of gingivitis in HIV infected individuals is greater than in normal uninfected individuals.

A study conducted by Masiga et al (2) showed out of 446 nursery school children, 37% had gingivitis.

Ohito F.A. et al (3) showed out of 449 handicapped children, 37% had gingivitis, and plaque was present at all sights examined.

Ng’ang’a et al (1) showed out of 515 primary school children, 25% had gingivitis. 75% of index tooth surfaces in the younger and 55% in the older age group had visible plaque.

Several studies have been carried out worldwide on gingival status of HIV positive patients. HIV associated periodontal diseases have been reported in literature for several years. Criteria for diagnosis of these diseases have not been universally accepted, although there are numerous papers describing the clinical entity. Whether patterns of these gingival changes described in these case reports are specific to HIV persons or represent severe immunosuppression requires further investigation.

Tukutuku et al (8). Zaire of 83 Aids patients assessed, prevalence of gingivitis was higher in AIDS patients than in healthy controls previously examined, despite good oral hygiene of the AIDS patients.

Masouredis et al (5) of 13 patients, HIV gingivitis was diagnosed in up to 58% of patients.

Laskaris G. et al (9) Greece of 178 HIV infected patients, 15.0% had gingivitis.
Schoen D.H et al (10) a study was conducted to compare incidence and progression of periodontal disease in HIV infected children, to their HIV negative household peers. A total of 121 subjects were examined. The study showed that with the exception of 25% of HIV positive children having gingivitis, the periodontal findings were similar to their HIV negative household peers and to the general paediatric population.

Winkler et al (11) showed that patients with severe immunosuppression as a consequence of infection by HIV are at a risk of a number of serious periodontal diseases e.g. HIV associated gingivitis and HIV associated periodontitis are seen exclusively in HIV infected persons.

Marilyn Gelbier et al. (12) 35 children with HIV attending the Great Ormond street hospital for children were examined gingivitis was present in 40% of the children. The mean score was 5.1 for gingivae of primary teeth and 5.7 for gingivae of permanent teeth. Of 35 children, 31 were of African origin and had been formerly been domiciled in Uganda.

FT Rames – Gomez et al. (13) A study was carried out on 22 children at the children hospital Oakland. Each child was examined quarterly the following results were seen. At age 0, 6% prevalence of gingivitis, age 1, 55% prevalence of gingivitis, age 2, 85% prevalence of gingivitis, age 3, 87% prevalence of gingivitis, and lastly age 4, 66% prevalence of gingivitis. In this study, gingivitis was more strongly associated with number of teeth.

Therefore primary oral health care for HIV infected children should include a careful oral examination at regular intervals to ensure early detection of oral diseases. Preventive oral health measures especially where treatment is unavailable can improve a child’s overall health. Although such measures cannot stop the progression of HIV disease in absence of medication, improved diagnosis of oral manifestations of HIV infection can enhance care management, ensure better oral health outcomes and improve quality of life for HIV – infected children.
RESEARCH PROBLEM

Problem statement and justification

The available data on the prevalence of periodontal diseases in HIV infected persons is unresolved. While numerous reports have been published, the results are conflicting due to different populations studied, lack of standardized criteria for data collection, study location and biased sampling.

It is essential that a distinction be made between those periodontal lesions that may occur in seropositive and seronegative individuals, and those, which appear to have more specific signs and symptoms associated with HIV infection and immunosuppression in general.

The occurrence of unusual and severe forms of periodontal disease in HIV – individuals is well recognized. Several classification schemes have been proposed in an effort to associate periodontal deterioration with progressive stages of HIV infection, and to determine aetiological factors in tissue destruction. No classification to date has proved entirely satisfactory. Smith G.L. et al (14).

HIV orphans are usually a neglected group with numerous problems especially opportunistic infections. They have dental problems to add to all their suffering. No study has been carried out in Kenya to find the prevalence of gingivitis in this group. The information collected will be used for planning of oral health services and education especially in homeless orphaned HIV children.
MATERIALS AND METHODS

OBJECTIVES
1. To determine prevalence of gingivitis in HIV positive orphaned children.

2. To determine and compare prevalence of gingivitis with increase in dental age. In relation to early, mixed and permanent dentition.

3. To determine and compare the prevalence of gingivitis in each sex.

4. To compare prevalence of gingivitis with plaque levels.

HYPOTHESIS
Prevalence of gingivitis in HIV positive orphaned children is greater than in normal children.

VARIABLES
Independent variables.
- Age.
- Sex.
- Stage of dentition. (Early, mixed, permanent)

Dependent variables
- Gingivitis.
- Plaque

Study Area
The study will be conducted at Nyumbani Children's Home, which is situated in the affluent suburb of Karen. It is the first hospice for HIV positive orphans in Kenya. It is a
freestanding, non-profit making organization, which has no binding affiliation with any governmental organizations or NGO’s.

It totally relies on donations from local and international well-wishers.

It welcomes volunteers from all walks of life, from volunteer students (local or from abroad) on vacation, to professionals such as medical doctors and nurses who give their service for a period of time or offer on-call services.

The stimulated village model and family life style living at Nyumbani Home allows many children to feel at home, loved and cared for the first time.

Study Population
Nyumbani home has 76 orphaned HIV positive boys and girls within the premises. Their ages range from 10 months to 18 years.

Study Design
A cross sectional study will be carried out.

Sample Size
Being a small sample, all 76 children will be examined.

Sampling method
The entire study population will be studied.

Data collection
The respondents will be examined seated on a normal chair in the open, using natural light. The data will be recorded by scoring on WHO forms. A periodontal probe will be used for probing the gingival sulcus to elicit bleeding. A dental mirror will be used for indirect vision and retraction. Disclosing tablets, which contained erythrosine, will be used to disclose the plaque to record a plaque score.
The history of medication for each child will also be noted down.

**Inclusion criteria**
All children present at the home on day of examination.

**Exclusion criteria**
- Children not present at the home on the day of study
- Any child who turned HIV-negative.
- Sick children not able to undergo examination due to inability to open their mouth.

**Indices used**
A modified index of Loe and Silness (15) will be used to score the condition of the gingivae and score the plaque levels.

**Modified Loe and Silness. Gingival component.**

This index will be used to score the status of the gingivae. The following teeth will be used:

16  11  26  46  31  36

On each tooth, both facial and palatal/labial sides will be examined.

The colour, size, attachment and bleeding on probing will be checked for on each tooth on each side, giving a total of 12 sides examined.

**Scoring criteria:**

0 = no inflammation, no bleeding on probing, no change in colour.
1 = slight inflammation, no bleeding on probing, slight change in normal colour or gingivae.

2 = more inflammation, oedema, bleeding on probing, loss of attachment, discoloration of gingivae.

3 = spontaneous bleeding, oedema, increased loss of attachment, discoloration of gingivae.

The score for each side of each tooth will be summed up, giving a total of 12 surfaces examined. The 12 scores were summed up and the total reflects the severity of gingivitis.

0 = no gingivitis
1 - 12 = mild gingivitis
12 - 23 = moderate gingivitis
24 - 36 = severe gingivitis

**Modification**

(i) In children with all permanent incisors and first molars, they will be examined.

(ii) In children with all deciduous incisors and deciduous 1st molars these will be examined.

(iii) In children with less than six teeth in the mouth all the teeth will be examined and summed and a mean from these teeth will be calculated.

(iv) In case of any missing index teeth, the next or adjacent tooth will be examined.
A modified version of Loe and Silness (15) will also be used to score the plaque levels. The same index teeth used in scoring the gingival component will be used in scoring for plaque, exception being in partially erupted teeth, the neighbouring or adjacent tooth will be scored.

After disclosing, both facial and palatal/lingual surfaces of the tooth will be examined and scored for plaque deposits. Scoring will be as follows:

0 = No plaque deposits
1 = Plaque deposits on cervical 1/3 of tooth
2 = Plaque deposits on cervical 1/3 of tooth as well as either mesial or distal 1/3 of tooth.
3 = Plaque deposits on cervical 1/3 of tooth as well as both mesial and distal 1/3 of tooth.
4 = Plaque deposits on whole tooth except incisal 1/3 of tooth.
5 = Plaque deposits on whole tooth.

A total of all 12 surfaces will be scored, which will reflect the severity of plaque levels.

0-20 = low
21-40 = moderate
41-60 = heavy

Logistics
Travel
A personal vehicle will be used to travel to and fro the study area for the period of data collection.

Instruments
The dental instruments, masks, gloves and disclosing tablets will be obtained from the University of Nairobi Dental School, on request from the department of Periodontology and Periodontics/Community and Preventive Dentistry.
The data will be analyzed manually and graphs were constructed using Microsoft Excel application, and the results will be presented in form of a percentage of prevalence of gingivitis and the score of gingivitis for each child. Graphs, pie charts and photographs will be used.

**Ethical considerations**

- Consent will be sought from the Home to carry out the study.
- The information gathered will be treated confidentially.
- Children in need of dental treatment will be referred to Nairobi University Dental Hospital.
- Photographs taken will exclude the children's eyes, for ethical reasons.

**Budget**

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APPENDIX

INVESTIGATOR

Age.........................................................

Sex.......................................................  

History................................................................
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GI (0-3)                                         PS (0-5)

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Teeth................................................................
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Comments................................................................
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REFERENCES


7) Nyumbani Children’s Home Information pamphlet.


