HOW DOES BLINDNESS IN PATIENTS AFFECT THEIR PERSONAL DENTAL HYGIENE?

SPECIAL CARE DENTISTRY

GROUP 10A-2

11/11/2020

ROUNDS TEAM

- **Group Leader: Dr. Yray**
- **Specialty Leader: Dr. Arif-Holmes**
- **Project Team Leader: D4-Eric Umhoefer**
- **Project Team Participants: D1-Teagan Pyszka; D2-India Martin; D3-Chet Singh**

PATIENT

- CC: “Nothing hurts right now, but I want to get going with appointments.”
- 78 years old
- Female
- African American

MEDICAL HISTORY

- Hereditary blindness
- Hearing impairment
- Arthritis
- High blood pressure
- Bronchitis
- Xerostomia
- Medications:
  - Metoprolol succinate
  - Amlodipine-atorvastatin
  - Losartan
  - Nature's Finest Multivitamin

DENTAL HISTORY

- Infrequent dental visits
- Maxillary and mandibular removable partial dentures
- Root canal treated #9 and 11
- Fixed partial denture #9-11
- Crowns on #4, 8, 12 and 13
- Brushes teeth sometimes and flosses once a day

RADIOGRAPHS

RADIOGRAPHIC FINDINGS

- Hypercementosis #4
- Defective restoration #12
- Recurrent caries #21
- Florid Cemento-Osseous Dysplasia (FOD)

CLINICAL FINDINGS

- Fissuring of dorsum tongue
- Palatal torus
- Defective restoration #6
- Recurrent caries #21
- Moderate plaque

PERIODONTAL CHARTING

																MOBILITY
																FURCA
																PLAQUE
																BOP
			5 5 5		5 5 5		7 7 7	7 7 7		6 6 6	5 5 5	5 5 5				MGJ
			3 5 4		2 2 1		4 3 3	2 1 2		3 2 3	3 1 2	5 3 4				CAL
			2 1 2		2 1 1		2 1 2	2 1 2		2 1 2	3 1 2	3 1 2				P.D.
			1 4 2		0 1 0		2 2 1	0 0 0		1 1 1	0 0 0	2 2 2				FGM
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
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				2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2				P.D.
				0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 1				FGM
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	
				2 5 1	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 3 1	0 1 2				FGM
				2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2				P.D.
				4 6 3	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 1 2	2 4 3	2 2 4				CAL
				3 3 3	4 4 4	5 5 5	6 6 6	6 6 6	5 5 5	5 5 5	5 5 5	4 4 4				MGJ
																BOP
					P P	P P	P P	P	P P	P P	P P	P				PLAQUE
																FURCA
																MOBILITY

DIAGNOSIS

- II-Early chronic periodontitis
- Moderate plaque

PROBLEM LIST

- Defective restoration #6
- Recurrent caries #21
- Moderate plaque
- Remake maxillary and mandibular removable partial dentures

D1 BASIC SCIENCE

- ***What oral hygiene adjuncts and instruction can be given to visually impaired patients to aid in improving oral health?***

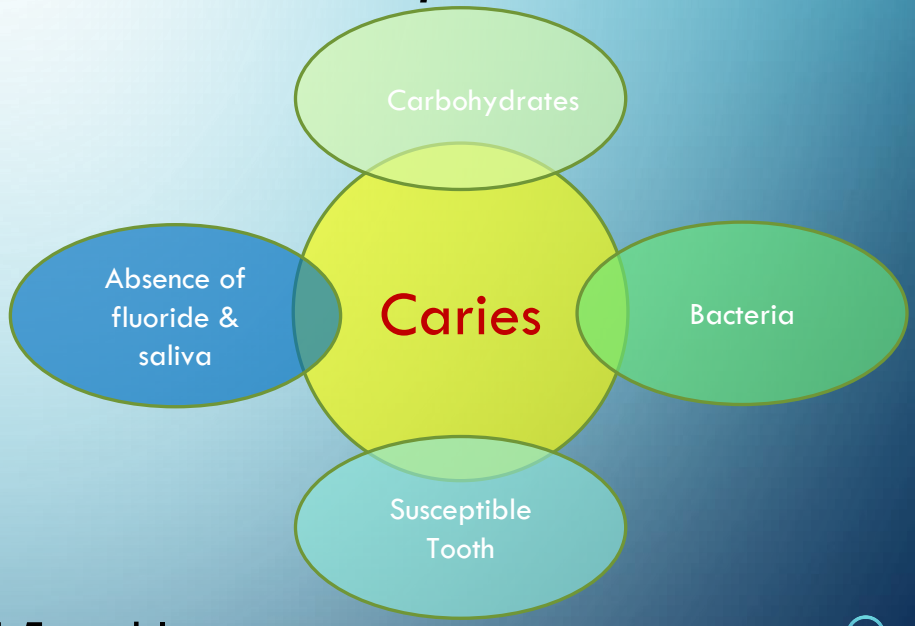
- **Personalizing Oral Hygiene Instruction**

ORAL HYGIENE ADJUNCTS

- Power toothbrush
- Reach access flosser
- Oral irrigator
- Mounted holders for oral hygiene tools

D2 PATHOLOGY

How do caries progress and how does Xerostomia affect this process?



Bacterial Cause:

- *Streptococcus mutans* (Initiation)
- *Lactobacilli* (Progression)

What happens:

- Biofilm aggregation
- Acid production
  - Enamel demineralizes at pH 5.5 and less
  - Repeated cycles of acid production without removal aids in caries progression

PROTECTING FACTORS

- Mechanical removal
  - Brushing, flossing, etc.
- Diet
  - Clean crunchy foods (carrots), water
- Fluoride
- Salivary flow

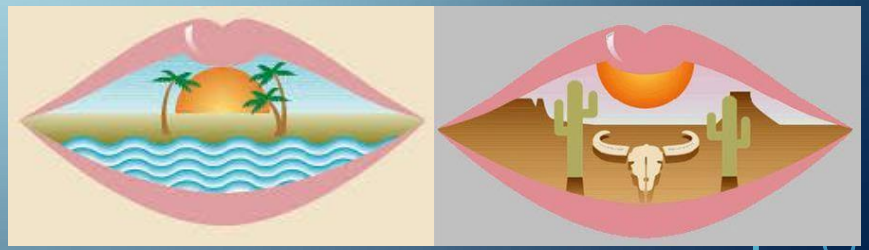
PROTECTING FACTORS

Saliva:

- Fluoride content
- Rate of flow
- Neutralize agents
  - Sodium bicarbonate, Phosphates, Sialin
- Re-mineralizing agents
  - Hydroxyapatite, Fluorapatite, Calcium ions, Phosphate ions, Proline, Statherins
- Antimicrobial properties

Xerostomia:

- Increased bacterial adherence
- Less protective factors
- Reduction of bacterial/carbohydrate clearance
- Medication-induced
- Age



D3 PICO

- **Clinical Question:**

  How does blindness in patients affect their dental personal hygiene?

PICO FORMAT

P: Patients with blindness

I: Dental hygiene education

C: No dental hygiene instruction

O: Improved personal dental hygiene

PICO FORMATTED QUESTION

"In patients with blindness, does personalized oral hygiene instruction aid in improving oral health and reducing caries risk compared to lack of oral hygiene instruction?"

CLINICAL BOTTOM LINE

- Oral hygiene does indeed improve oral health outcomes in blind individuals

SEARCH BACKGROUND

- **Date(s) of Search: 2000-2020**
- **Database(s) Used: Pubmed**
- **Search Strategy/Keywords:** Blindness, oral hygiene, visually impaired

SEARCH BACKGROUND

- **MESH terms used:**
  - **Oral hygiene, blindness, health education, toothbrushing, child, visually impaired, disability, sensory aids**

ARTICLE 1

THE IMPLICATIONS OF VISUAL IMPAIRMENT IN AN ELDERLY POPULATION IN RECOGNIZING ORAL DISEASE AND MAINTAINING ORAL HEALTH

- Citation: Schembri A, Fiske J. The implications of visual impairment in an elderly population in recognizing oral disease and maintaining oral health. Spec Care Dentist. 2001 Nov-Dec;21(6):222-6. doi: 10.1111/j.1754-4505.2001.tb00258.x. PMID: 11885671

- Purpose: The aim of this pilot study was to identify the problems in maintaining oral health and the perceived need to seek treatment by a group of visually impaired people

ARTICLE 1 SYNOPSIS

- Methods / Study Design : The study population was comprised of 62 legally blind elderly people aged 60 and over. The participants came from three environments-an institutional setting, a residential home, and the community. The method of investigation consisted of a structured interview and an oral examination. All the interviews and all the examinations were carried out by one researcher. Clinical oral exams were undertaken to identify caries, failed restorations, mobile teeth, teeth wear, retained roots, gingival health, plaque, calculus, and oral mucosa pathology.

- Results: All of the participants would be potentially able to maintain their own adequate oral health level if given the appropriate stimulus. At the time of the study, 53% brushed their own teeth, 39% of whom brushed daily. Of the denture wearers, 58% cleaned them at least once a week. Most of the participants were independent. Eighty-two percent believed that they did not need help to brush their teeth or dentures, even though 85% had never been shown how to brush their teeth. Eighty percent of people did not realize that regular oral reviews were necessary. Other barriers to regular care included poor health, mobility problems, cost, and fear. Twenty-one percent of the sample had toothache or a denture problem.

- Conclusions: The rates dental diseases occur similarly in people with disabilities as compared to their peers without disabilities. However, the degree of periodontal disease may be higher because of the difficulty of achieving adequate oral hygiene without the visual feedback of seeing if plaque has been removed or if gums bleed when brushed. In this pilot study, over 50% of people had gingival inflammation.
  - Professionally assessed treatment need was greater than the visually impaired people's perceived need for care.
  - For blind individuals, It may be necessary to provide information on audiocassette or in Braille.
  - Create adaptations and routines that allow them to be totally independent in oral hygiene care and to develop pride in their achievements
  - The barriers to access to oral health services need to be reduced

- Limitations: Legally blind isn't necessarily completely blind, its visual acuity of 20/200 or less

- Reason for selection: Study dealt with subjects that were older (>60) thus results being more accurate for our patient

- Implications: Since the results of the study support the use dental health education, preventive measures, and advice on environmental aids for independence. When independence is not possible, it's recommended they rely on supervision is what I'd advise D4

Levels of Evidence

☐ **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)

☐ **1b** – Individual RCT

☐ **2a** – Systematic Review of Cohort Studies

☐ **2b** – Individual Cohort Study

☐ **3** – Cross-sectional Studies, Ecologic Studies, "Outcomes" Research

☐ **4a** – Systematic Review of Case Control Studies

☐ **4b** – Individual Case Control Study

☐ **5** – Case Series, Case Reports

☐ **6** – Expert Opinion without explicit critical appraisal, Narrative Review

☐ **7** – Animal Research

☐ **8** – In Vitro Research

Strength of Recommendation Taxonomy (SORT)

★	**A**–Consistent, good quality patient oriented evidence
☐	**B**– Inconsistent or limited quality patient oriented evidence
☐	**C**–Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

ARTICLE 2 CITATION, INTRODUCTION

Debnath A, Srivastava BK, Shetty P, Eshwar S. New Vision for Improving the Oral Health Education of Visually Impaired Children- A Non Randomized Control Trial. *J Clin Diagn Res*. 2017;11(7):ZC29-ZC32. doi:10.7860/JCDR/2017/26515.10170

Study design: Non randomized control trial
Study purpose: to understand effectiveness of specialized oral hygiene instruction

Method: Non-randomized control trial. 40 visually impaired students at a specialized school were given oral health education talk and a booklet in braille was delivered stressing the importance of oral health. The study was aimed to assess the effectiveness of oral health innovative educative method among these visually impaired children.

Patients were aided in exploring oral structures on dental casts, music based brushing techniques were provided, a health talk was also given. The seven golden rules for health mouth were explained: 1. Brush your teeth twice daily 2. Floss once a day 3. Clean your tongue daily 4. Rinse your mouth after every meal 5. Eat nutritious foods 6. Limit snacking between meals 7. Visit dentist every six months

The interventions were conducted by the primary investigator and the plaque scores were recorded by secondary investigator.

Results: The results were assessed with a KAP score. Knowledge, Aptitude, and Practices. Overall KAP was lower in the pre-intervention period among the visually impaired children with mean score of 6.98 while after the modified oral health education session, it was increased to a mean score of 14.68 which was statistically significant at $p<0.001$. There was a significant change in the oral plaque scores with 80% of the children having fair scores in the pre-intervention period to 30% in the post intervention period

ARTICLE 2 SYNOPSIS

Conclusions: This oral health education module showed good results which can be implemented to effectively increase the awareness about dental health among blind individuals

Limitations: limitations of the study was that the number of individuals selected for the study were from the same institute and of a particular age group

ARTICLE 2 SELECTION

Article was selected because authors accurately described the challenges faced by individuals and study included 40 individuals and incorporated the KAP metric which could be easily assessed.

Implications: This study supports individualized and specialized oral hygiene instruction for blind patients.

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ARTICLE 3

- Citation: Khurana C, Tandon S, Chand S, Chinmaya BR. Effectiveness of oral health education program using braille text in a group of visually impaired children-before and after comparison trial. *J Educ Health Promot*. 2019;8:50. Published 2019 Mar 14. doi:10.4103/jehp.jehp_233_18

- Study Design: A prospective nonrandomized before and after comparison trial without any control group was conducted among 165 children aged 7–19 years residing in one of the blind schools in Delhi
- Study purpose: Evaluate the impact of Braille text and verbal, oral hygiene instructions on the oral health status of visually impaired children

ARTICLE 3 SYNOPSIS

- Method: Questionnaire was developed to record oral health knowledge and practices. Oral health status of the children was evaluated by recording plaque index (PI) and gingival index (GI) scores at 1, 3, and 5 months intervals. Periodic reinforcement of oral health education was performed with the help of instructions in Braille language
  - Instructions included: Importance of oral health, Importance and functions of teeth, Importance of brushing twice a day, Proper method of tooth brushing, Different oral hygiene aids, Distinguish between beneficial and harmful foods for oral health, Harmful oral habits.

- Results: Among completely blind children, the mean difference of PI and GI score from baseline to the last evaluation was found to be 0.56 and 0.28, whereas among partially blind children, it was found to be 0.58 and 0.25, respectively. All the above values were statistically significant ($P < 0.001$).

CONCLUSIONS

- Visually impaired children irrespective of the degree of blindness could maintain an acceptable level of oral hygiene when taught using Braille text for instructions. This showed that an effective, repetitive dental health education could not only improve awareness and attitude toward importance of oral health but also can bring a significant change in oral hygiene
- There was a significant reduction in the mean PI at all time intervals. However, continuous motivation and reinforcement at regular intervals are required for the maintenance of oral health status.

- Limitations : This study was done without a control group. Comparative studies with control group should be done to get better result. This could also present significant limitations if the individual doesn't read braille.

ARTICLE 3 SELECTION

- This article was selected because
  - There was as sufficient sample size of individuals (165)
  - It included subjects that were completely blind and not just partially
  - The potential conclusions, if positive, could be relevant to our patients

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CONCLUSIONS: D3

How does the evidence apply to this patient?

- The evidence is very applicable and relevant to our patient. Advise D4 to include specialized patient instructions on oral hygiene within the treatment plan for the patient.

Based on the above considerations, how will you advise your D4?

- I would advise the D4 that oral hygiene instructions in braille could be provided to our patients as well as helping them explore the oral anatomy on a dental cast.

CONCLUSIONS: D4

Based on your D3's bottom line recommendations, how will you ***advise*** your patient?

Stress the importance of oral hygiene maintenance at home

How will you ***help*** your patient?

Help patient to improve oral hygiene and decrease caries risk

DISCUSSION QUESTIONS

- Questions???

THANK YOU

A friend of mine won Dentist of the Year, and all he got was a little plaque.