Challenges of Measuring Caries Among Older Adults in Long-Term Care

BOSTON UNIVERSITY

Zinah Ismael, Himani Sanwaria, Bathsheba Turton, Kadambari Rawal, Joseph Calabrese
Boston University, Henry M. Goldman School of Dental Medicine

Introduction

The DMFT index has traditionally characterized caries experience but overlooks early lesions and complicates disease progression mapping. Root caries indices face similar issues and suffer from measurement variability. Recently, there has been an increased focus on lesion activity and disease progression using indices like CAST and ICDAS, the latter having a more established history in clinical studies. This shift allows for reliable early detection and tracking of progression prior to surgical intervention. The ICDAS index has not been used among older adults in long-term care, highlighting the need for potential adjustments to improve disease characterization in this group. Caries is a dynamic disease, so understanding its progression in the later stages of life helps us better determine the necessary level of intervention and its proportions among various subgroups of the population. Appropriate intervention, grounded in a precise understanding of disease progression, can help inform systems of strategies that may prevent the consequences of uncontrolled dental caries in older adults, such as pain, infection, and aspiration phenomena.

Objective

To validate the protocol for using ICDAS in documenting **caries lesion progression** among older adults in long-term care settings.

Methods

As part of a program aimed at improving the design of oral health services for older adults in long-term care, a study was conducted to validate the use of ICDAS within this population. In an epidemiological study at a long-term care facility, four examiners underwent calibration to collect data using the ICDAS II Index. The calibration involved three hours of training by the principal investigator, followed by testing until 100% agreement was reached over a series of three tests. A subset of ten residents was co-examined to identify limitations in applying the index.

Previously Restored Teeth

Post and core present

Solution
- Chart as being free from a caries lesion
- Add a supplementary index to capture pulpal status.
- Vertical cracks are not captured within ICDAS
- If under a crown, unable to be observed and not captured in the data frame.

Rationale

We are focused on detecting caries progression. If a new lesion develops, this will allow us to identify it in the data at the 1-

Cervical restorations +/- caries symptoms

Solution
- Determine stain vs demineralization
- If initial demineralization is present then chart according to lesion severity. E.g. early signs of enamel breakdown around restoration = ICDAS Code 3

Rationale

Charting the ICDAS code for the symptoms observed around the restoration would allow us to accurately track lesion progression. Restoration size does not factor in tracking lesion progression.

Dental Implant

Solution.
- A new code was added to identify implants.
- Teeth categorized as Permanent, Primary, Missing or Implant
- If implant status is unclear due to lack of x-rays we default to charting as a permanent tooth

Rationale

Miscategorized implant supported restorations will not falsely indicate caries lesion. This will not reduced sensitivity of our index to tracking caries activity.

Results

Clinical issues included :

- Historical treatments affecting charting, such as decorated incisors and restored surfaces with unclear etiology.
- Aging-specific issues like heavily worn incisal edges and enamel craze lines.
- Applying the ICDAS II criteria for root lesions. Discrepancies were documented and resolved to enhance the detection of caries progression. Figure 1-3.

Root Lesions

Depth of lesion rather than extent of lesion used

Solution.
- Add additional code to depict when the lesion covers >1/2 the root surface.

Rationale

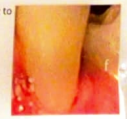
Lesions in image d & e would be scored with the same severity score in ICDAS Recommendations. We need to be able to detect accurately the spread of the lesions, even if the depth remains similar or comparable.

Sound Cervical restorations, which may have been placed to restore tooth wear rather than caries.

Solution
- Report decayed and filled root surfaces separately to coronal zones.

Rationale

Regardless of reason for restoration, when and if anew lesion develops, then we can detect the change at that point. E.g. initial breakdown of enamel around a restoration would be coded as ICDAS code 3 or 4.



Age-specific considerations

Craze lines

Solution.
- Chart as being free from caries
- ICDAS code = 0

Rationale

This is not a caries process, if signs of caries develop around the craze line at follow-up then we will be able to detect those changes accurately within the data.

Worn incisal edges

Solution.
- Chart as being free from caries.
- Assign to facial/buccal surface

Rationale

Although a disease process is present, it differs from the caries process we aim to track. If it's a mixed lesion involving both caries and erosion, it will be reflected in the ICDAS index.

Abrasive wear at crown margin +/- plaque accumulation

Solution.
- Cleaning, and an optimal light source during exam, even when not in the dental surgery.
- Include these scenarios in calibration training

Rationale

Cervical areas around crowns are high risk zones, and so calibration training plays an important role in accurate charting of disease

Conclusion

Although the ICDAS index has yet to be widely adopted for epidemiological studies in long-term care, it shows promise for accurately characterizing disease distribution at the population level, necessitating standardized data and clearer descriptions of root lesions.

References

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