INTRODUCTION

Many surveys and studies to find out the reasons given for placement or replacement of amalgam restorations have been carried out in various countries. It has been shown that the results obtained from the various studies were affected by national differences\textsuperscript{1,2} and time when these surveys were conducted, the latter being due to the type of material available at such times.\textsuperscript{3,4} Criteria for placement and replacement of amalgam restorations had been studied by various authors in the developed economies\textsuperscript{5-14}, whereas there is dearth of reports for developing countries.\textsuperscript{15} Incidentally there has been no study on the placement and replacement of amalgam restorations in Nigeria. Therefore the aim of this study was to carry out a study to provide a result meant for Nigeria since it has been established that there are variations in results obtained from different countries and to establish a baseline study and data from and for Nigeria as well as to find out the criteria given for placement and replacement of amalgam restorations in Nigeria and to compare the results obtained in this study with other studies.

Controlled, longitudinal prospective studies would be best when studying longevity of restorations, however, it is unrealistic to expect such investigations to exceed 10 years due to many problems that would beset the study.\textsuperscript{16} It has also been recognized that longevity of restorations may be registered in longitudinal, prospective or retrospective studies; or it may be assessed in cross-sectional, retrospective studies of dental records, provided such are available to show the complete treatment performed over many years.\textsuperscript{17}

This study is therefore a retrospective assessment of dental records of regular attenders at the Dental Centre and Dental School, University College Hospital, Ibadan, Nigeria.

METHODOLOGY

The materials used in this study were dental records of patients seen in the School of Dentistry / Dental Centre of University College Hospital, Ibadan, Nigeria between 1979 and 1992. The records of patients chosen were those that had had restorative procedures carried out on one or more of their teeth during this period. The were properly scrutinized and
serialized and the final records were based on regularity of patients’ attendance, in the dental clinic for a minimum period of 5 years. All records showing inconsistencies either in treatment received or irregularity in the clinic attendance were eliminated from this study. Any record showing ambiguity in treatment given or in a particular tooth treated or even in tooth nomenclature were also eliminated.

All the records that were found suitable were recorded serially and the following data recorded for each patient:

- Name of patient
- Age
- Sex
- Index number
- Residential/Contact address
- Type of restorative treatments received
- Dates when such restorative treatments were received
- Reasons given for restoration placement/replacement.

After elimination of records that were found not suitable for this study, the serial numbers used earlier were still adhered to so as to enable easy tracing of all treatment records. This method ensured that no treatment records were missed or mixed up during compilation and analysis of the data collated.

The following criteria grouping were adopted

- Primary caries
- Secondary caries
- Bulk fracture
- Marginal failure/ditching
- Dislodged restoration
- Cervical abrasion
- Others – attrition, overhanging restoration, fractured cusp/s etc.

RESULTS

The records obtained between 1979 and 1992 showed that two thousand nine hundred and twenty eight amalgam restorations were placed but after the screening of the records only two thousand and ninety four amalgam restorations were found suitable for this study. This study involved adult patients whose age at the time of first placement was equal to and above 16 years of age.

The distribution of amalgam restorations according to Black’s definition showed that one thousand two hundred and fifty eight (1258) amalgam restorations were Class 1 accounting for 60.08% of the total number of amalgam restorations; seven hundred and seventy (770) amalgam restorations were Class 2 thus accounting for 36.77% of the total restorations while sixty six (66) amalgam restorations were class 5 (3.15% of total restorations). (Table 1)

There were various reasons given for placement and replacement of amalgam restorations but these reasons were compiled and pooled together to make the result a more compact and manageable one in order to enable easy comparison with other results obtained elsewhere (Table 2).

The frequency analysis and distribution according to reasons given for placement and replacement of amalgam restorations showed that placement of amalgam restorations formed the highest number of the total restorations placed.

Primary placements were one thousand five hundred and fifty two (1552) amalgam restorations accounting for 75.74% of total amalgam restorations placed while replacement were five hundred and eight (508) amalgam restoration accounting for 24.26% of all restorations. Table 3 gives the summary of results of amalgam restoration.

Recurrent caries was the reason given for replacing fifty nine amalgam restorations (2.82%), complete dislodgement of amalgam restorations accounted for 1.3% (27 amalgam restorations) of the total restorations placed; eight (0.38%) were replaced because of overhanging amalgam while other reasons made up the rest (1.53%).

| TABLE 1: DISTRIBUTION OF AMALGAM PLACEMENTS/REPLACEMENT ACCORDING TO LOCATION |
|-----------------|-----------------|---------------|
| Class of Restoration | No. of Restoration | % of Total |
| Class 1          | 1258            | 60.08        |
| Class 2          | 770             | 36.77        |
| Class 5          | 66              | 3.15         |
|                  | 2094            | 100%         |
Placement and Replacement of Amalgam Restorations in Nigeria

DISCUSSIONS

Retention study of dental records is also useful in assessing longevity, placement and replacement of restorations provided such records show the complete treatment performed over many years. However, many variables often cannot be controlled in retrospective studies e.g. brand material used, clinical conditions at the time of treatment and the quality of original restorations placed.16-19

Placement and replacement of amalgam restorations was registered using the retrospective method by studying the dental records of regular attenders; although a prospective longitudinal study would have been the most ideal, it is, however, unrealistic to expect such investigations to exceed ten years.17,18,20

A total of two thousand and ninety four amalgam restorations were placed and the percentage of amalgam restorations placed because of primary caries was 74.12%, total primary placement accounted for 75.74% and those that were replaced as a result of several other reasons were 24.26% (1552, 1586 and 508 amalgam restorations respectively) which contrasted with almost all results from the developed countries published before now.

The treatment pattern in previous studies showed that the percentage of amalgam restorations placed due to primary caries had national variations ranging from 29% - 69.9% in amalgam restorations placed in an adult population.7,8,9,14,21

However, there are few reports emanating from developing economies that showed a higher figure of caries being the most common reason cited for placement and replacement of amalgam restoration.22-25

Comparison of the result obtained in this study with other results showed that a greater percentage of placement procedures is being carried out thus indicating an alarming increase in caries activity profile in this environment while previous treatment experience (replacement) is very low; therefore the statement that the dentist spends more than half of his time replacing old fillings does not apply to this environment yet.7,13

All the alloys used in this country were imported with no records of the type of alloys used during this period.

Secondary caries as a reason for placement of amalgam restoration constituted 2.8% of all restoration placed (59 amalgam restorations) but when considered in terms of reasons for failure of amalgam restorations did not apply to this environment yet.

Note that the reasons include cervical abrasion, fractured cusps and attrition.

TABLE 2: REASONS FOR PLACEMENT/REPLACEMENT OF AMALGAM RESTORATIONS

<table>
<thead>
<tr>
<th>Criteria</th>
<th>No. of restorations</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary caries</td>
<td>1552</td>
<td>74.12</td>
</tr>
<tr>
<td>Fractured restoration</td>
<td>338</td>
<td>16.14</td>
</tr>
<tr>
<td>Marginal fracture/defective amalgam restorations (&quot;ditching&quot;)</td>
<td>78</td>
<td>3.72</td>
</tr>
<tr>
<td>Recurrent caries</td>
<td>58</td>
<td>2.77</td>
</tr>
<tr>
<td>Dislodged restorations</td>
<td>26</td>
<td>1.24</td>
</tr>
<tr>
<td>Overhanging amalgam</td>
<td>08</td>
<td>0.38</td>
</tr>
<tr>
<td>Others (include cervical abrasion, fractured cusps, attrition)</td>
<td>34</td>
<td>1.62</td>
</tr>
<tr>
<td><strong>2094</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>

TABLE 1: CRITERIA SPECIFIED AS REASONS FOR REPLACEMENT/PLACEMENT OF AMALGAM RESTORATION

(a) Primary Caries
(b) Fractured Restoration
(c) Marginal Fracture/Ditching
(d) Recurrent caries
(e) Dislodged Restoration
(f) Overhanging Restoration

Others – Cervical abrasion, fractured cusp, attrition

TABLE 3: SUMMARY OF RESULTS OF AMALGAM RESTORATIONS

<table>
<thead>
<tr>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of restoration</td>
<td>2094</td>
</tr>
<tr>
<td>Number of restorations placed due to primary caries</td>
<td>1552</td>
</tr>
<tr>
<td>Number of restorations placed due to other reasons</td>
<td>34</td>
</tr>
<tr>
<td>Number of restorations replaced</td>
<td>508</td>
</tr>
</tbody>
</table>

Note that the reasons include cervical abrasion, fractured cusps and attrition.
restoration, it accounted for 11.6% of all replacements unlike in other studies where higher figures were obtained.

Several reports in the literature revealed that secondary caries has been shown to be the major reason for placement or replacement of amalgam of restorations and the results given varied from 50-59%.1-5,7-9,11,14,26,27 whereas in this study the result showed that recurrent caries accounted for only 11.6% of all amalgam restorations.

Although the high-creep amalgam alloys have been associated with ultimate secondary caries formation this has not been the case in this study. The high rate of secondary caries has been attributed to the fact that dentists could mark more than one reason in their questionnaire this has not been the case in this study.1-4

In Nigeria and probably in most developing countries south of Sahara, there is an evidence of increasing caries activity due to “imported civilization” due to large scale importation of refined sugars, chocolates and end-products of refined carbohydrates with no corresponding increase in oral hygiene practices and government funding or established policies on primary oral health care. There are no defined policies on fluoridation of drinking water, worse still there is a dearth of proper and adequate portable drinking water in most towns and villages in Nigeria, thus making it more difficult for fluoridated drinking water to be delivered. Most of the fluoridated supplements with the exception of tooth pastes are not available for large scale public use.

The reasons for the high rate of placement of amalgam restorations may however, be due to over diagnosis of caries especially on pits and fissures and this may be due to reduced understanding and application of the criteria for diagnosis of carious lesion vis-à-vis placement of restorations by the practitioner. This is in line with what was reported on the wide variations seen in diagnosis of primary caries by clinicians due to subjective interpretation of caries diagnosis.

It is also important that there should be established, varied, reliable and universally acceptable guidelines which should be specific to minimize subjective interpretation to assist the dentist in making clinical judgment.14

It was concluded that there were 3 important factors involved in placement and replacement of amalgam restorations27,28 namely the proficiency of the operator or the dentist, oral hygiene and patients habits and type of material used.

CONCLUSION

In Nigeria, the conditions affecting amalgam restorations are different from those affecting developed countries and this is due to the differences in dietary habits, established government policies on oral health, increasing availability of refined sugar products and the changing lifestyles of people in a developing economy.

This also confirms the fact that caries incidence is increasing coupled with increasing availability of refined sugars in the market without a definite corresponding primary oral preventive programme policies by the government has led to the alarming increase in the primary placements seen in this study.

There is therefore, an urgent need for increased orientation and re-orientation of patients and the populace concerning oral and dietary habits and a vigorous attempt at caries reduction programs especially from the school age level to avert the dental catastrophe that could arise from this.

Finally there has to be a specific and well defined guidelines and principles for diagnosis and treatment planning especially for primary placements to avoid over diagnosis of caries as this will go a long way in assisting the practitioner in making clinical judgments.

REFERENCES

Placement and Replacement of Amalgam Restorations in Nigeria


