CHAPTER - II

MATERIALS AND METHODS
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In Bundelkhand region, we had chosen district Jalaun for the epidemiological study of dental caries. The reason behind the selection of District Jalaun is lowest fluoride concentration in its natural water as evident from Table No. 2.1

Table 2.1 Fluoride Distribution in Natural Water of Bundelkhand Region

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of District</th>
<th>No. of samples</th>
<th>Maximum fluoride content (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Banda</td>
<td>6</td>
<td>0.8 - 3.0</td>
</tr>
<tr>
<td>2.</td>
<td>Hamirpur</td>
<td>3</td>
<td>0.6 - 1.6</td>
</tr>
<tr>
<td>3.</td>
<td>Jalaun</td>
<td>5</td>
<td>0.1 - 0.8</td>
</tr>
<tr>
<td>4.</td>
<td>Jhansi</td>
<td>6</td>
<td>0.2 - 1.2</td>
</tr>
<tr>
<td>5.</td>
<td>Lalitpur</td>
<td>2</td>
<td>0.1 - 0.6</td>
</tr>
</tbody>
</table>


GENERAL INFORMATION OF DISTT. JALAUN

Area- 4565 Sq.Km.

Population- 986238

Male - 537017 (54.45%)

Female - 449221 (45.54%)
Rural Population - 789786 (80.08%)

Urban Population - 186852 (19.90%)

Sugar Cane Production - 860000 metric Ton per year.

Table 2.2 Age-wise Distribution of Population, Jalaun

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0-14 yrs.</td>
<td>191199</td>
<td>159786</td>
<td>350985</td>
<td>35.58</td>
</tr>
<tr>
<td>2.</td>
<td>15-59 yrs.</td>
<td>223107</td>
<td>195150</td>
<td>418257</td>
<td>42.40</td>
</tr>
<tr>
<td>3.</td>
<td>More than 60</td>
<td>122711</td>
<td>94285</td>
<td>216996</td>
<td>22.02</td>
</tr>
</tbody>
</table>


Map of Distt. Jalaun is showing the location of different towns and it's boundaries to neighbouring districts.

The study is conducted in two groups-

1. To assess the prevalence of dental caries in deciduous as well as permanent teeth and to assess their susceptibility pattern, the children of 5-16 years were kept in one group.

2. Adult population (17-40 yrs.) was studied as second group.

This grouping is also helpful in getting clear epidemiological picture of dental caries because dietary habits, care of oral hygiene in above two groups are very different.

For the children population we carried the study in
different schools of Distt. Jalaun covering both rural as well as urban areas. To cover the non school going children, we examined the children who came to attend the O.P.D. of District Hospitals as well as private clinics including dental wing.

For Adult population, we carried the study in Dental Department of District Hospital, and Private Dental Clinics at Orai, Jalaun, Kuthand, Kalpi, Nadigaon and Kadora.

I had taken the training to carry out dental examination in field conditions. Initially the study was done at dental clinics so dental examination was done under direct supervision of dental surgeon. Only after getting full perfection the study was shifted to other places like schools and hospitals out door and other private clinics.

Criteria used in making a diagnosis of early caries was a catch with the explorer. The dental examination was carried out with the help of mouth mirror and a explorer in sufficient day light facing away from sun. The persons were comfortably seated in a chair. To record incipient carious lesions uniformly, a 18 u thick (at the tip) explorer was used for each child and explorer's fips were restandardised after use. To ensure continuous consistency in recording, 10% of persons at random basis were recorded by dental surgeon and compared to maintain a constant cheque throughout the study. The peridontal health status was also assessed.
Recording of dental caries was done by using the following criteria.

**Caries Recording Criteria**
(Moller's Index-1966-Modified)

<table>
<thead>
<tr>
<th>Smooth Surface</th>
<th>Caries 1</th>
<th>Caries 2</th>
<th>Caries 3</th>
<th>Caries 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>White opaque area with loss of luster</td>
<td>Slight discontinuity in the enamel</td>
<td>A definite cavity with pulp involvement</td>
<td>Probable complication</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pit and fissures</th>
<th>Caries 1</th>
<th>Caries 2</th>
<th>Caries 3</th>
<th>Caries 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discolouration of the Pits and fissures with slight sticking of the probe</td>
<td>Definite sticking of the probe in pits and fissures with or without discoloration, the probe requires a definite pull for it's removal</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**Grade**
- 5-Filled
- 6-Indicated for Extraction
- 7-Extracted due to caries
- 8-Unerupted
- 9-Extracted due to other reasons
- 0-Sound surface

The Examination for carious lesion may require the use of different explorer to adequately examine all the surfaces of a tooth. The explorer must be sharp and well suited to the area to be examined.

The examination is systematic and begins at a specific
location and proceed systematically tooth by tooth throughout the dentition. A mouth mirror and a firm sharp explorer are necessary. The field of observation should be dry and well illuminated. Special attention is given to any variation in shade and colour of enamel and any change in texture and hardness. These are significantly altered in the presence of dental caries.

The initial lesion of caries is generally seen as an opaque or white slit. These areas may later become pigmented or shallowed.

Unless the explorer is sharp and fine many areas of occlusive decay may be overlooked. Use of bite wing radiograph will increase the yield of carious lesion. Manipulation of explorer and sufficient pressure to push the exploring tip into soft decayed tooth structure will result in a hung or catch.

The examination should begin with a specific tooth and proceed systematically throughout the arches. All surfaces of a tooth should be examined completely before proceeding to the next tooth. The examination may begin at occlusal surface, proceed towards proximal surface and wind up on labial or lingual surface. Palpable softening of enamel and dentine should be counted as caries. Early enamel lesions in pits and fissures where softness could not be elicited by probe were not included in this study.

To assess the level of oral hygiene following criteria
was used.

**Oral Hygiene**

1. Good - No detectable food particle in mouth.
2. Fair - Soft food debris present in the mouth.
3. Poor - Food debris of long standing coating the majority of teeth.

It must be emphasised that the clinical examination of teeth with a mouth mirror and explorer only or by radiograph alone is never sufficient.

X-ray are of special values in localising the following

1. Recurrent decay
2. Occlusal caries
3. Proximal Carious lesion

**X-ray:** It is necessary that radiograph should have proper contrast in order to show dental caries in all the area of tooth in which decay occurs. X-ray should be examined for caries in same sequence each time. The carious lesion should be listed in numeric order as they are on X-ray.

Initially the carious process will appear as a 'V' shaped radiolucent zone in enamel with the apex of 'V' towards the dentoenamel junction when it occurs at contact part of tooth. When an initial carious area is occlusal developmental fissure, the process involving enamel is not early detected, thus occlusal caries involves dentin before it is discovered radio-
graphically. As the carious process involves the dentin, a wider radiolucent zone can be seen extending well beyond the apex of the lesion in the enamel along the junction between the enamel and dentin. In advanced caries the radiolucency will appear as a large, dished out area. When dental caries as advanced, it is quite simple to interpret X-ray. However, initial incipient caries involving occlusal fissures require close examination of X-ray.

Some silicate restorations are radiolucent and may resemble radiographically with caries. So clinical examination is must.

**Terminology used:**

The following terms are used in the present study.

1. **D.M.F.** per person = \[
\frac{\text{Total No. Caries (Decayed+Missed+Filled)}}{\text{Tooth in Adult}}
\]
\[
\frac{\text{No. of persons having caries}}{1}
\]

2. **d.e.f.** per person = \[
\frac{\text{Total No. caries Primary Tooth}}{\text{No. of children having primary tooth}}
\]

**LIST OF PLATES**

**Plate 1** Instruments used for detection of dental caries.

a. Mouth Mirror    b. Explorer    c. X-ray

**Plate 2.1** Photographs showing Anatomy of Maxillary Teeth

**Plate 2.2** Photographs showing Anatomy of Maxillary Teeth.
Plate 2.3 Photographs showing Anatomy of Mandibular Teeth.

Plate 2.4 Photographs showing Anatomy of Mandibular Teeth.

Plate 3 Photograph showing Dental caries in different types of extracted Tooth. (Site of caries is Marked)

Plate 4 Photograph showing Dental caries in maxillary Teeth (Adult)

Plate 5 Photograph showing Dental caries in mandibular teeth (Adult)

Plate 6 Photograph showing Dental caries in mandibular deciduous teeth.

Plate 7 Photograph showing X-ray of carious lesion in IIInd mandibular Molar Teeth.