Comparative dental morphology and analysis in historical and recent populations

Ph. D. THESIS

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Contents

1. INTRODUCTION

The theme has through and got to the centre of my interest I have experienced the macro morphological, dental morphological deformations provide useful information tooth in anthropological and dental respect. In anthropology respect, teeth provide considerable help since teeth are the most durable structures of human organization and they hardly change their shape and size throughout our lives (Alt, Türp 1997, 1998).

Examining the teeth judgement as well as solutions of a great number of controversial questions.

Teeth and jaws are of crucial importance in many disciplines, including historical anthropology, paleopathology, archaeology, dentistry, comparative anatomy, genetics and embryology. Forensic medicine can use the teeth to identify the victims (Bartucz 1966).

We can observe the development of teeth and jaw in different periods, the variations in each population, moreover the influencing factors of nutrition and environment with respect to the whole man and his teeth (Brabant 1962).

The dental morphology of different historical populations is of great interest to us, as the signs of certain morphological changes can observed through migration. Surveys display that Carabelli cusps are very rare in the Mongoloid type, while more frequent in europid populations. Both cusps provides information in comparing different types of man, since, similarly to, other various dental characteristics, this also appears in various form and in various intensity.

In most periods, teeth are regularly adjusted in dental arch, whereas in recent centuries occlusion differences appear in 60% of children, necessitating orthodontic treatment.

In recent population, the changes in nutrition, soft, squashy food, rich in carbohydrates, has necessity of prevention (Bánóczy 1998, Newbrun 1989). All these nutritional factors have no impact on the normal occlusion of teeth, the number of overbite and other cases, the concomitants of modern society.

2. AIMS

The theme of the dissertation comprises the dental morphological analysis of historical anthropology and our recent population throughout my work, I kept track of partially used the methods of anthropology, thus anthropometry (metric measuring) (Martin, Saller 1958, Lipták 1980, Scott, Turner 2000, Schulze 1987), morphology, anthropometry (metric measuring), cephalometry (skull X- ray), odontometry (tooth measuring) (Farkas 2003).

In my research, odontometry is of great importance. I used this method with both historical and recent populations, which extends to their dental morphological features.

My analysis comprises the comparison of peoples in the age of Árpáds, the Hungary.

Assuming a close connection between recent population and that of the age of the Conquest and the Avar mixes involving migration in recent populations.

Conquest is still prevalent. In the 14th and 15th centuries the shortening of the skull (brachicephaisation) is noticeable. The proportion of long-headed in large numbers in the age the Árpáds population, is merely about 88% today (Farkas 2003).

The aim of my paper is divided into the following parts.

- Dental morphological differences in historical periods: Carabelli, talon cusps
- examination and comparative analysis of the Eastern migration factors in Hungarian population on the basis of teeth, than I compare with our population. (Dahlberg 1971, Hattab, et al. 1995, Scott, Turner 1998).
- Measuring the size of the facial skull (Martin, Saller 1962, Farkas 1981).
- Studying the molars impact of third of historical and recent populations. The connection between the size of mandible and the eruption frequency of the third molars (Henry, Morant 1936, Bishara, Andreasen 1983, Bodzsár 1999).

My examinations are extended to the different epigenic features in the populations of different ages. The findings originating from geographically different places (cemeteries) mainly belong to europid type, other belong to the mongolid type. This allows defining the morphological features characteristic of different types.

3. MATERIAL and METHODS

Research material and methods of examination the Anthropology of the Hungarian Museum of Natural Science.

When compiling the research material we as much as possible, represent all historical ages under discussion. According to the anthropology and historical data it is widely known that the leading layer of the avars belonged to the mongolid type Juan-Juan(Tóth

1972)at the time of Hungarian . Conguest the leading leayer is to be carracterized of the mixed europo-mongolid features (Fóthi 2006)

The recent samples were taken at the Children's Dental and Orthodontic Clinic, Semmelweis University (600 children's samples were examined(model casts) and Szeged University (SZTE)

Pediatric Clinic the outpatient department, this data were completed with 127 children

model-casts. To mark the samples, the 7 grade Dahlberg scale (Dahlberg 1971) were used for Carabelli cusps. To exemine for talon cusps, Hattab division was used. 386 girls and 335 boys age of 7-18 took part in the examination.

The research material was extended to measuring the mandibulae. Measuring the mandibulae of historical peoples differed according to historical ages, here I also examined the space maintains for the 3rd molars.

In recent samples this measuring was carried out on the OP X-rays by Henry – Morant's methods (Henry, Morant 1936). In this groups my examinations were extended to record some other dental morphological features (supernumerary teeth, aplasia, transpositio, enamelhypoplasia).

The result of my cariologic survey is also included in my paper. Here the investigation represents the survey of high school 15-18 aged in 1994 at SZTE Dental Clinic.

4. RESULTS and DISCUSSION

In my statistical analysis I used the SPSS programme package. In three historical ages we can see noticeably different line of value.

Primary statistical summary of the basic data according to the resources in all my cases my research was at random. I examined the following:

1. Carabelli cusps and talon cusps

I investigated both historical and recent populations. The samples were 727 children's model casts. Carabelli and talon cusps are expressed in several degrees and different frequencies between humans, thus being useful in comparing and characterizing populations. I compared recent groups and skulls from the 11th century, the so-called Árpád era. The Carabelli cusps was investigated for the first upper permanent molars and scored according seven grade classification. The talon cusps on permanent upper lateral incisors were also examined by Hattab classification. The prevalence of Carabelli cusps was 65.34 per cent in contemporary and 34 per cent in 11th century population ($P<0.01$). The contemporary group showed a prevalence of talon cusps of 2.5 per cent compared with 40.8 per cent for the skulls from Árpád-era, which was significant($P< 0.001$).These findings demonstrate that the contemporary Hungarian population is a mixture of europid and mongolid types.

2. Measuring the both jaws

This is examined and compared only historical population.

Maxilla: zygomaticus- zygomaticus distance

In second molars of distal surfaces distances

This are compared thus demonstrating in historical era and the exists of Izard index.

My measuring in lower jaw.

Mandibulae: ramus mandibulae length

Ramus mandibulae width

Incisura mandibulae depth

This shows us the mix of recent populations.

3. Tooth reduction

In my materials there are many cases of aplasia, mostly the third molars. There is no difference in the sexes. Hypodontia is more frequent, than hyperodontia.

In this respect I compared only in the skulls from Árpád era and recent populations it to the OP X-rays. The space maintenance behind of third molars is 4.4 mm in Árpád age, whereas in recent populations there is hardly any space.

So the chart shows the problems of eruptions of third molars comparing the cases from Árpádien age and recent age.

4. Abrasion

I can be measured only in the skulls of historical samples because recent population it does not occur.

Here I would mention nutritional habits ancient populations were significantly different those of recent populations.

5. Caries

While abrasion in the historical samples were very frequent, caries rarely occurred. In our population caries is very frequent.

6. Other teeth and jaws irregularities

In historical samples there were hardly any irregularities and recent populations they are very frequent.

In recent populations the following irregularities occurred:

a, supernumerary teeth: 1..92%

b, aplasia: 10.33%

c, transpositio: 0.43%

d,enamelhypolasia: 1.3%

SUMMARY

Comparing the two groups of populations we can assert, that size of tooth and jaws have reduced. The frequency of caries has increased in recent people compared in historical samples. The positions of the jaws also displays irregularities. My patients are measuring the facial types, these findings demonstrate that the contemporary Hungarian population is a mixture of europid and mongolid types. This characteristics (reduction, gracilisation) are due to geographic and environmental changes.

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