Summary of: A comparative anthropometric study of the position of the mental foramen in three populations

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FULL PAPER DETAILS

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Method The position of the mental foramen was recorded in relation to the mandibular teeth and anatomical landmarks on the mandible in 76 Chinese, 46 European and 33 Indian skulls of known or calculated age at death. One way analysis of variance (ANOVA) with Tukey's test was used to compare the means of the three groups. **Results** The length of Indian mandibles was significantly smaller than that of Chinese ($p < 0.001$) and European ($p < 0.05$), but there was no significant difference between European and Chinese mandibles ($p > 0.05$). The distance from the symphysis menti to the mental foramen was not significant in European and Indian mandibles ($p > 0.05$), though the latter were significantly smaller than the Chinese ($p < 0.001$). The distance from the mental foramen to the posterior border of the ramus of the mandible was significantly larger in Chinese and European skulls compared to that of Indian ($p < 0.01$), there being no significant difference between European and Chinese ($p > 0.05$). There was no significant difference in the relative position of the mental foramen (distance from symphysis menti to the mental foramen divided by the length of the mandible) between the Chinese and Indian mandibles ($p > 0.05$) but there was a significant smaller difference between the European and both Chinese and Indian ($p < 0.001$). The modal position of the foramen in the Chinese was in line with the long axis of the second premolar, while the European and Indian between the first and second premolar. **Conclusion** The notion that the mental foramen lies between the first and second premolars can no longer be accepted. Population differences occur and preoperative radiographs are mandatory.

EDITOR'S SUMMARY

Human variation forms the very basis of our existence both as individuals and as the foundation of our practices. If all teeth and every scrap of gingival tissue were the same as any other then we would hardly need the diagnostic and technical skills that we develop and hone over years of experience.

This variety is expressed in countless ways and is responsible in part for dentistry being both art and science; but neither an abstract art nor an exact science. Human anatomy plays an important part in this almost infinite variation. One has only to visit the Hunterian Museum to see the skeleton of the Elephant Man, to mention but one example, to observe the extremes of the human form.

In terms of everyday practice the finer points on the anatomy of a single

foramen may not seem too relevant and yet we know only too well that an unsuccessful local anaesthetic can make the difference between a satisfied patient and a failed treatment. The research reported here may on the face of it seem somewhat esoteric and yet the finding of the slightly different locations of the mental foramen in different ethnic groups could prove to be significant, especially in relation to the placement of implants, and of other surgical procedures.

With an ever-increasing international mix of patients in the UK, but also elsewhere in the world, an appreciation of anatomical as well as social characteristics of diverse groups can serve to make the distinction between good and excellent care. The extent to which further research can highlight other distinctions remains to be

seen and the clinical implications yet to be realised but in an ever-changing world such enquiry is timely and to be welcomed.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 212 issue 4.

Stephen Hancocks

Editor-in-Chief

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IN BRIEF

- Draws attention to the variation in position of the mental foramen in different ethnic groups.
- Gives indications on how to assess the position of the mental foramen relative to standing teeth and mandibular anatomy.
- The foraminal position is not always as stated in older textbooks.
- Radiographs are mandatory in all clinical operations such as endodontics, apical surgery and implants, prior to operation.

COMMENTARY

As a striking effect of globalisation, most countries not only face an increase of residents of different ethnic origin, but also an increase of global healthcare consumers. While it is generally acknowledged that certain aspects of health and healthcare are greatly influenced by ethnicity, many clinicians are still not aware about the variation of certain structures with regard to the ethnic origin of their patients.

In this paper Santini and Alayan report on the position of the mental foramen (MF) in the skeletal material of three distinct populations of known origin: European, Indian, and Chinese. The MF is the external opening of the mandibular canal just below the premolar region. For the clinical professions, an exact knowledge about the occurrence of the MF is essential for a successful block of the mental nerve by local anaesthesia and other procedures in maxillofacial surgery and prosthodontics. Although the mental block is a rather simple technique, it is well known that the position of the MF varies considerably, even though numerous clinical and anatomical textbooks still pretend a position of the MF between the apices of the two premolars.

As the mandibles differed significantly in size, the authors studied the position of the MF in relation to both mandibular landmarks and teeth. The authors noted significant differences in the relative position of the MF between the European and the two other popu-

lations. Although a position of the MF just beneath the region between the mandibular first and second premolar was the most common in both the European and Indian material, in the Chinese population the MF was situated more posteriorly, usually around the second premolar. It should be noted that these findings represent only the modal positions. Since in each population the MF was found in front or behind this modal position, clinicians should be cautious in cases of procedures requiring attention to the MF. In addition, like other nonmetrical cranial traits, this information about the MF may be also useful for anthropologists working with extant and extinct human populations to explore intra- and inter-population relationships.

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AUTHOR QUESTIONS AND ANSWERS**1. Why did you undertake this research?**

The mental foramen is an important anatomical structure representing the termination of the mental canal. Its accurate identification depends on knowledge of its location, this being strategically important for diagnostic and clinical procedures such as the administration of regional anaesthesia, performance of periapical surgery, surgical extractions, endodontics, implant placement and osteomy. The reported anatomical position has been inconsistent, with standard anatomy and radiology textbooks containing conflicting statements regarding its position. Moreover the position as reported in the literature is population dependent. The latter suggested that an in depth comparative study using different material from different populations was appropriate.

2. What would you like to do next in this area to follow on from this work?

The study was conducted using digital callipers as the main measuring instrument. Computerised laser scanning and measurement techniques are now being undertaken on the same material. These will hopefully improve the accuracy of measurements/results, as well as create a permanent record of the population material more easily accessible to others.