On occasion, the Journal receives manuscript submissions that, in the opinion of the Editor, discuss issues in periodontology that would be of interest to our international readership, but lack the scientific rigor required for publication. Such manuscripts, which often are more learned opinion than the results of controlled clinical trials, can be accepted under the category of 'Letter to the Editor.' Readers are cautioned not to reference such publications in support of scientific assertions.

LETTER TO THE EDITOR

Epidemiologic Observations on the Clinical Crown to Root Ratio, the Root Contour, and the Alveolar Housing of the Jaws in White, Black and Asian Races

Epidemiologists are concerned with observations related to groups of individuals, while clinicians are more often concerned with the individual patient. This approach does not prevent the clinician, after many years of treating a broad cross-section of individuals of various races, from making some succinct observations. No studies have been found correlating anatomical crown to root ratio, root contour, and alveolar housing of the jaws in white, black and Asian peoples. The following discussion represents the author's observations over many years in the private practice of periodontics.

The subjects studied included Asians (227 patients), whites (591 patients), and blacks (314 patients) ranging in age from 30-50 years. The analyses were made clinically and radiographically (including panographic and 18 film long-cone paralleling periapical x-rays with a millimeter overlay), and compared the shape and thickness of the roots to the length of the crown (enamel position) and the trabecular pattern of the bone structure in each of the three specified races. The results of these clinical observations showed that Asians often have more abruptly conical (ice-cream cone) shapes to the roots and a slightly smaller crown to root ratio than that seen in white and black people. The Asian people also exhibited the least amount of buttressing bone formation compared to whites or blacks. However, in the presence of traumatic occlusion, tooth mobility increased more rapidly in Asians than in either of the other two groups.

Whites usually exhibited a crown to root ratio of 1:2, while the root shape (thickness and length) favored tooth longevity compared to that of Asians, as buttressing bone formation was greater than in Asians but less than that observed in blacks. In blacks the crown to root ratio was slightly greater than in either of the other two groups, with the crowns being slightly larger and the roots being thicker and longer, allowing for more bone loss to take place before the teeth would become mobile.

Mechanical loads can affect bone architecture in patients, but just how was not known until Frost (2004) established that it occurs, as well as describing some of its applications. He noted that load-bearing bones gain strength from muscle forces, which influence just how strong a bone may become, and thus may have an effect upon the healing of fractures, bone grafts, and implants. Artificial change in the stress applied to a bone could cause changes in the trabecular pattern to accommodate the load (Bassett and Becker, 1962; Becker, 1964; Cochran, 1968; Gjelsvik, 1973a, 1973b; Shamos and Lavine, 1964; Lavine and Shamos, 1972).

The fact that the roots of teeth vary in size and shape among Asians, whites and blacks may be related to their varied responses to orthodontic and/or occlusal forces. Also, the observation that traumatic occlusion led to tooth mobility earlier in Asians than in either of the other two races may have treatment implications for managing periodontitis in Asians. Blacks had less tooth mobility because of their generally longer and larger roots, their denser trabecular pattern with more abundant trabeculae, and their generally more massive bone structure.

Clinical studies comparing radiographic interpretation, root size and contour, crown to root ratio, generalized structural anatomy, trabecular bone, trabeculae, osteoporosis (and other systemic factors) and the effect of deformation are some areas that need further investigation.

What can be surmised from the brief previous discussion is that Asians show greater tooth mobility with minimal bone loss, while blacks can undergo greater bone loss while maintaining a stable dentition, as compared to white and Asian people.

References

Bassett CAL and Becker RO. Generation of electric potentials by bone in response to mechanical stress. *Science* 1962; **132**:1063-1064.

Becker RO, Bassett CAL and Bachman H. Bioelectric factors controlling bone structure. In H. Frost (Ed): *Bone Biodynamics*. Boston. Little, Brown and Company 1964, pp 213-231.

Cochran GVB, Pawluk RJ and Bassett CAL. Electromechanical characteristics of bone under physiologic moisture conditions. *Clinical Orthopedic Related Research* 1968; **58**:249-270.

Gjelsvik A. Bone remodeling and piezoelectricity. I. *Journal of Biomechanics* 1973a; **6**:69-77.

Gjelsvik A. Bone remodeling and piezoelectricity. II. *Journal of Biomechanics* 1973b; **6**:187-193.

Lavine LS and Shamos MH. Electric enhancement of bone healing. *Science* 1972; **175**:1118-1121.

Shamos MH and Lavine LS. Physical basis for bioelectric effects in mineralizedtissues. *Clinical Orthopedic Related Research* 1964; **35**:177-188.

Stephen B. Weinmann
240 Prospect Avenue Apt # 330
Hackensack, New Jersey, USA 07601-2552
Telephone:+1-201-343-3116
E-mail drsbweinmann@optimum.net