Morphometric Analysis of Inferior Alveolar Canal Using Cone Beam Computer Tomography in a Sri Lankan Population

L.A.I.U. Liyanaarachchi[1]*, S.D.T. Laksala[1], G.E.T. Lakshan[1], P.M. Peiris[2], R.D. Jayasinghe[2], H.M.R.W. Angammana[3]

[1]Faculty of Dental Sciences, University of Peradeniya, Sri Lanka
[2]Department of Oral Medicine & Periodontology, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka
[3]Department of Basic Sciences, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka
**d17031@dental.pdn.ac.lk*

The Inferior Alveolar Canal (IAC) is a single intra-osseous canal present bilaterally in the mandible. Cone Beam Computed Tomography (CBCT) is the best diagnostic image modality which can be used to assess the IAC. Morphometric knowledge of the IAC is important in dental treatments and to prevent complications. A retrospective cross sectional descriptive study was conducted using 87 CBCTs of individuals who attended the dental teaching hospital Peradeniya which included 52 females and 35 males within the age range from 18 - 42 years. We have assessed 130 IACs. On trans-axial view, visibility, shape and distance to IAC from outer buccal and lingual cortical plates, from inferior border of the mandible and root apices were assessed at 2nd mandibular premolar, distal roots of 1st and 2nd molar regions. Also, the horizontal and vertical relationships of the IAC to the tooth roots, course and presence of the bifurcation were evaluated. Statistical analysis was done. The majority of canals were oval in cross section. IAC was closer to buccal cortical plate in 2nd premolar region, to lingual cortical plate in the 2nd molar and 1st molar region. There was a significant difference in the distances to IAC between gender groups with males having thick bony periphery. The horizontal course of the IAC was suggesting an "S" shaped configuration, being buccal to 2nd molar root apex, lingual to 1st molar root apex and apical to the 2nd premolar regions. In the vertical course majority of IACs were closest with the roots of the 2nd molar followed by the 2nd premolar and 1st molar and 57% were progressively descend type while 30% was catenary type and 12% were straight in their course. A 44.6% of the canals showed bifurcation with majority being type IIIa; forward canal without confluence type. This first Sri Lankan CBCT study detailed IAC morphometry, revealing common oval cross sections, 'S' shaped course and 44.6% bifurcation prevalence. Understanding these variations, especially proximity to roots and cortical plates, is Crucial for preventing iatrogenic complications in dental procedures, enhancing patient safety.

Keywords: Inferior alveolar canal, CBCT, canal bifurcation