**Original article:**

**A Morphological and morphometric study of foetal and adult, human foramen magnum in relation with age changes, sexual dimorphism and symmetry**

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**Abstract:**

I**ntroduction:** Foramen Magnum (FM) is The most important bony foramen at the skull base, and the information regarding this foramen is useful for various skull base surgeries, radiological and forensic investigations, anatomical and anthropological studies. This study is carried out with following aims 1) To study various dimensions of foramen magnum. 2) To study comparative morphometry of the foramen Magnum between foetal, adolescent & adult age. 3) To study symmetry of the foramen Magnum with respect to midline. Also statistical analysis has been carried out to show the age changes and morphology of foramen magnum from foetal to adult age and in male and female sex and to show the symmetry of foramen magnum.

**Method:** 181 skulls of known sex (age ranging from 13 to 60 and above), and 54 foetal skulls were studied from different medical institutes in Maharashtra, Karnataka, Andhra Pradesh, and Chattisgarh states of India. The skulls were divided into 5 groups as A: foetal age group; B-f: female skulls of age group 13-25 years; B-m: male skulls of age group 13-25 years; C-f: female skulls of age group above 25 years; C-m: male skulls of age group above 25 years.

**Observations and results:** Foramen Magnum showed statistically significant difference in its morphology as the age advanced from foetal to adolescent and adolescent to adult age. Foramen Magnum showed significant sexual dimorphism within adoloscent group (p<0.05) but did not show significant sexual dimorphism within adult group. Further the foramen magnum showed significant asymmetry in foetal age and it becomes more symmetrical with advanced age, however it was longer posteriorly than anteriorly. In some foetal and adult skulls, the FM also showed a significant angle between its anteroposterior diameter and the Y-axis mid sagittal line of the skull.

**Conclusion:** The dimensions of FM show statistically significant increase from foetal to adult age, the FM shows significant sexual dimorphism within adolescent male and females but not within adult male and females. The FM is significantly asymmetrical in foetal age and becomes more symmetrical as the age advances to adolescent and adult age. The FM is longer posteriorly than anteriorly and sometimes shows an angle between its anteroposterior diameter and Y axis, and this angle can be seen in all the age groups.

**Key Words:** Foramen Magnum