COMPUTED TOMOGRAPHIC EVALUATION OF CRANIOFACIAL PARAMETERS FOR SEXUAL DIMORPHISM IN SOUTH INDIANS

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Key words: *CT skulls, cranial measurements, sexual dimorphism, south Indians*

Background. Determination of sex from bony elements is the fundamental step to human virtue. Direct assessment of the bones is not always most appropriate or practical.

Aim. The aim of our study was to examine the reliability of cranial measurements for sex differences in computed tomography head scan records of adult live subjects to the highest possible percentage and to develop discriminant function equations.

Material and Methods. Seventy head computed tomography records were taken and 16 parameters were measured using RadiAnt DICOM viewer software. The data was analyzed using SPSS software.

Results and Discussion. The classification accuracy obtained by multivariate analysis of all 16 variables was 97.1%, multivariate analysis of 9 most significant variables was 91.4% and by stepwise was 92.9% and that by univariate analysis for bizygomatic breadth, orbital breadth, basion-bregma height and inter-orbital breadth was 81.4, 74.3, 72.9 and 70%, respectively.

Conclusions. Multivariate analysis gave the highest classification accuracy and bizygomatic breadth, orbital breadth, basion-bregma height and inter-orbital breadth were the most dimorphic variables in our study population and several other populations, and thereby should always be considered in the sex determination of humans.

ANATOMIC AND X-RAY JUSTIFICATION OF THE METHOD OF LOCAL ANESTHESIA IN THE AGE ASPECT IN DENTISTRY

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Key words: *x-ray, local anesthesia, mandible, teeth, children*

Aim. To study the anatomical and radiological prerequisites for carrying out local anesthesia on the mandible in pediatric dentistry from the point of view of Wright's rule.

Material and Methods. 120 computer tomographs of the mandible of children aged 5 to 12 years without pathology of the maxillofacial area were examined. A mathematical calculation of the thickness of the cortical plate in the cervical (C), middle (M) and apical third (A) parts in the area of the teeth 8.3 (7.3), 8.4 (7.4), 8.5 (7.5), 3.6 (4.6). For the anatomical study, skeletal mandibles of children from 4 to 7 years of age were used. Morphometric measurements of bone structures were performed on the mandible. Wright's rule was used in the following formulation: if the number of full years of the child in the amount of the ordinal number of the tooth in the Roman style is 10 or less, infiltration anesthesia will suffice to anesthetize this tooth.

Results and Discussion. The tendency to compact the cortical plate is determined in proportion to the age of the child. However, with the imposition of empirical values according to Wright's rule on the anatomical and x-ray characteristics, the mathematical model lags behind the biological model. It was also noted that the organization of bone structures is faster for girls.

Conclusions. The use of the X-ray method of investigation makes it possible to use it as a tool for choosing the method of local anesthesia of molars and canines teeth in pediatric dentistry.

DIAGNOSIS AND TREATMENT OF PATIENTS WITH ARTERIOVENOUS MALFORMATIONS OF HEAD AND NECK USING 3D MULTIDETECTOR COMPUTER TOMOGRAPHY ANGIOGRAPHY

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Key words: *arteriovenous malformation, treatment*

Aim. The goal of our investigation was to optimize diagnosis and treatment of patients with arteriovenous malformations (AVM) of head and neck using 3D multidetector computer tomography angiography (MDCTA).

Material and Methods. 24 patients aged 15–52 years (14 male and 10 female) with diagnosis extracranial AVM of different localization in head and neck region were examined and treated. Examination included clinical, laboratory, ultrasound diagnosis, MDCTA and digital subtraction angiography. Treatment plan was created individually in each case, based on the data gained by diagnostic procedures. Treatment options included surgical treatment, embolization of AVM or combined treatment. In certain cases several steps of treatment were planned. Patients were observed after treatment for 5 years.

Results and Discussion. AVM were localized in one or several regions including frontal, tem-

poral, palpebral, labial, nasal, submental, occipital, postauricular, infraorbital and buccal regions. Ultrasonography has shown a lesion with regular or irregular contours, heterogeneous structure with high and low echogenic sites. MDCT-angiography allowed to define size and depth of the lesion, vessel diameter, bone tissue involvement and participation of intracranial vessels in blood supply of the AVM. Combined treatment was performed in 17 cases (including embolization with surgical removal of AVM in 16 cases and electrochemical lysis and surgical removal of AVM in 1 case), and combined treatment was performed in 7 cases.

Conclusions. Complementary diagnostic tools allow determining different parameters of AVMs that are necessary for treatment planning. Combined use of ultrasonography and 3D MSCTA provided precise treatment planning and helped to obtain good results.

TRACTOGRAPHY OF THE BASAL GANGLIA IN PATIENTS WITH ALZHEIMER'S DISEASE

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Key words: *alzheimer's disease, basal ganglia, tractography*

Background. Although there are many studies of Alzheimer's disease (AD) focused on temporal and cortical atrophy, basal ganglia have received only little attention.

Aim. Our aim was to visualise neural tracts of the basal ganglia and measure their parameters in patients with AD and healthy controls.

Material and Methods. 10 patients with AD and 10 healthy controls underwent MRI. Neural tracts were reconstructed in caudate, putamen and pallidum using DSI Studio Following parameters were obtained: number of tracts (NT), tract length (TL), tract volume (TV), generalized fractional anisotropy (GFA) and normalized quantitative anisotropy (NQA). Results were analysed using Statistica 10.0 software.

Results and Discussion. Based on statistical analysis we obtained following statistically significant ($p<0.05$) results. There was seen decrease of NT in right caudate in patients with AD. On the contrary, in right and left putamen was observed an increase in NT and NQA in patients with AD. Similarly, in left pallidum was observed an increase of NQA and in right pallidum an increase of NT and NQA in patients with AD.

Conclusions. Increase of NQA represents higher density of neural tracts in putamen and pallidum in patients with AD suggesting a compensatory mechanism.

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RELATION BETWEEN THE GROWTH OF 0–18 MONTH-OLD INFANTS AND BMI OF THEIR MOTHERS

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Key words: *growth, breastfeeding, BMI, weight-for-age, weight-for-length*

Background. Overweight and obesity belong to major civilisation diseases in developed countries. Their impact is recorded not only for mothers (loss of breastfeeding, especially after 4–6 months after delivery) but also on the child growth and development (hypertension, dyslipidemia or high birth weight). This situation is also triggered by family environment.

Aim. Our study compared basic anthropometric parameters of children until 18 months of age with percentile growth charts of Czech population.

Material and Methods. Data of 1765 children and their mothers collected in 2009–2010 were used for the study. The children were divided according to BMI categories of mothers. Software RustCZ based on the Czech growth charts was used for finding the percentile values of length-for-age, weight-for-age, weight-for-length and BMI-for-age for all measurements of every child at all monitored ages. Reference data are results of the 5th and 6th Nationwide Anthropological Survey (1991 and 2001).

Results and Discussion. Studied group composed of 7.6% obese mothers, 9 of whom had BMI above 40 kg/m^2. Full breastfeeding at the maternity hospital discharge was present in 90% of normal BMI mothers (average time 8.5 months) but only in 76%