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BOOK OF
ABSTRACTS
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1 NATURAL COCOA INHIBITS MATERNAL HYPERCHOLESTEROLAEMIA INDUCED ATHEROGENESIS IN RABBIT PUPS

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Atherosclerosis begins during foetal development and is enhanced by maternal hypercholesterolemia during pregnancy. This study assessed the effect of natural cocoa on atherosclerosis in offspring conceived in maternal hypercholesterolemia. Female rabbits were fed cholesterol-enriched diet for 2 weeks and hypercholesterolemia confirmed, after which they were crossed with normocholesterolemic males. One group (HCC) received natural cocoa powder (NCP) in their drinking water, whereas the other (HC) received only water. Histological analysis of three segments of the aorta (arch, thoracic, and abdominal) from offspring of both groups were compared to a control group (NC). Intima media thickness of the aortic arch in offspring born to hypercholesterolemic rabbits (HC: 146 μm) was higher compared to HCC (99 μm) and control (58.5 μm). All the sections from aortic arch of HC had atherosclerotic lesions whiles none of the sections of the aortic arch from control (NC) and HCC groups had lesions present. Inferentially, regular and voluntary consumption of NCP during pregnancy may inhibit aortic atherogenesis in offspring of hypercholesterolemic mothers.

2

SEX DETERMINATION USING DISCRIMINANT ANALYSIS OF HAND DIMENSIONS AMONG ADULT POPULATION IN GHANA

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Identification of a person forms a significant aspect of forensic investigation. Hand index derived from hand dimension plays an important role in determining sex, age and race in forensic and legal sciences. Sex determination from anonymous body parts has been very important in forensic and legal sciences. Sexual dimorphism has been reported using various body parts including hand measurements in several races but no study has been conducted among Ghanaians. This study therefore aimed at using discriminant analysis in the determination of sex from hand dimensions. A sample of 150 participants was recruited into the study. They were made of 79 females and 71 males aged between 18 and 90 years as maximum growth of hand is attained at age 18 years onwards. The hand length and breadth of both hands of each participant were measured. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20 for Windows. There was significance different between male and female height and hand dimensions. The male participants had higher hand dimensions than the female participants. The mean right hand length was 17.5 ± 1.17 cm (females) and 19.1 ± 1.38 cm (males) while the left hand length was 17.7 ± 1.18 cm (females) and 19.0 ± 1.38 cm (males). The predominant hand type among the participants was mesocheri. The accuracy of sex determination using the formula derived was 74.0%. Hand dimensions are smaller in females as compared to the male participants. The predominant palmer type was the mesocheri and demonstrated high accuracy for the determination of sex. This serves as a preliminary study and further study in larger sample size would be helpful in sex discrimination among Ghanaians.

3 ASSESSMENT OF CASSAVA STARCH AS SUBSTITUTE FOR AGAROSE IN DNA GEL ELECTROPHORESIS

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The use of agarose is the gold standard in nucleic acid gel electrophoresis. However, agarose is very expensive and not readily available in resource limited developing countries like Ghana. Hence, finding a more affordable and readily available alternative to agarose will be a major boost to molecular research in developing countries. This study was aimed at investigating the use of cassava starch as a potential substitute for agarose in DNA gel electrophoresis. Genomic DNA sample was extracted from *Plasmodium falciparum* and amplified using polymerase chain reaction (PCR). The amplicon was run on agarose gel to ascertain the molecular weight (as a positive control), the DNA and ladder showed clear and clean bands under both blue light and ultra-violet light. Cassava starch was then modified with sodium borate buffer, casted into a gel and used to run the same DNA sample. The findings indicated that similar to agarose, the DNA sample and ladder migrated successfully through the modified starch gel but no bands were visible when visualized under blue and ultra-violet light. Though the modified cassava starch showed gelling and DNA migration properties were similar to agarose, the gel was however cloudy as compared to agarose and did not permit visibility of DNA sample. We suggest further modification to optimize the use of cassava starch gel as substitute for agarose in DNA gel electrophoresis.

4 HEIGHT AND SEX DETERMINATION USING NASAL AND OCULAR DIMENSIONS AND THEIR RELATIONSHIP WITH TRIBE

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Height and sex are reliable biological profiles for human identification especially in the field of anthropology and forensic science. Also cephalometric parameters are useful in inter-racial and intra-racial morphological classification and categorization. As such, facial parameters in combination with fingerprint patterns, height and sex serve as prominent identification tools for biometric and forensic purposes in the developed world. However in Ghana, very little information is available on metric facial data such as ocular and nasal indices and their association with ethnicity, sex and age. Therefore the aim of the present study was to generate data on nasal and ocular dimensions and to evaluate their relationship with height and tribe. A total of 288 participants (62% males and 38% females) aged between 17 - 26 years were recruited for the study. Informed participant consent and ethical approval were sought prior to the study. Height, ocular and nasal measurements were measured. The results of the present study showed that with the exception of right eye fissure and nasal tip protrusion, Males had significantly higher nasal and ocular dimensions than females. Morphological nose width varied significantly among the four tribes with Akans recording the highest mean value. The predominant nose type among the four tribes was platyrrhine (flat nose type). Biocular width and anatomical nose width were the best dimensions for height estimation. Also, intercanthal width, nasal height, nasal length, morphological nose width, biocular width and anatomical nose width were the best dimensions for sex prediction. The nasal and ocular dimensions of Ghanaians in the present study differed significantly from those of North Western Indians, Turkish, North Americans, Caucasians and Italians. The results of the present study provide additional data on ocular and nasal anthropometric dimensions of Akans, Ga-Dangmes, Northerners and Ewes in Ghana and are useful for biometric and forensic purposes and facial reconstructive surgery.

5 — MATERNAL RELIGION AND DIET, AND ITS ASSOCIATION WITH PLACENTAL INDEX IN THE UPPER EAST REGION OF GHANA

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Maternal nutrition during pregnancy has a pivotal role in the regulation of placento-foetal development and thereby affects the lifelong health of offspring. Placental index, the commonest ratio used to represent foetal and placental growth relations is growingly becoming a measure used to indicate intrauterine environment. A disproportionately heavy placenta is suggestive of placental hypertrophy and may indicate an adaptive response to an adverse intrauterine environment. This study sought to determine maternal religion and diet pattern and their association with placental index. Using a cross-sectional study, the research was carried out at Garu Presbyterian Hospital and Quality Medical Centre, both in the Garu-Tempane District in the Upper East region. A total of 94 women who delivered in the two facilities were enrolled to participate in the study. Weighing of babies and placenta (immediately after birth) was done using Docbel-Braun Baby Classic bench scale (India) and recorded into the hospital's delivery book along with information about the sex of the babies, gestational age and mother's age. Maternal information was obtained from the administered questionnaire. Of the participants, there were 48 Christians, 41 Muslims, and 5 traditionalists, representing 51.1%, 43.6% and 5.3% respectively. Mean birth weight was 2.69 kg (0.42) whilst those of placental weight and placental index were 0.65 kg (0.23) and 0.24 (0.09) respectively. The mean birth weight of babies whose mothers were Christians, Muslims and Traditionalists were 2.75 kg (0.38), 2.63 kg (0.45), and 2.62 kg (0.44) respectively. The mean placental indices were 0.2398(0.07), 0.2520 (0.11), and 0.2157(0.74), corresponding to Christians, Muslims and Traditionalist respectively. '*Tuozafi*' emerged as the most frequently eaten food (57.4%) within the study population. One-Way ANOVA showed significance p = 0.040 and critical value F = 1.68, demonstrating a statistical significance of the difference between-group means for maternal diet (correlated with maternal religion) and placental index. Thus, maternal diet and religion influenced birth weight and placental indices of the study.

6. DETERMINATION OF HEIGHT, SEX AND TRIBE USING PERCUTANEOUS HUMERAL AND FEMORAL LENGTHS

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Height, sex and tribe play a crucial role in the identification of an individual. Height is influenced by nutrition, genetic constitution, and metabolic abnormalities among others. In most developed countries, there is a well-structured system of osteometric data for the determination of height and sex. However, very little information is available on the use of osteometric indices for forensic and biometric purposes in Ghana. Therefore the aim of the present study was to determine the height, sex and tribe of participants using percutaneous humeral and femoral lengths. Two hundred and ninety-seven undergraduate students of the Kwame Nkrumah University of Science and Technology, Kumasi with 58% males and 42% females aged between 16 – 34 years were recruited for the study. Males were significantly taller than females. Males also presented with significantly longer femoral and humeral lengths than the female participants. The right humeral and femoral lengths were numerically higher than their respective lengths on the left. This difference was however, not significant. The mean humeral and femoral lengths differed significantly from those reported among Jordanians, South African whites and Western Indians. Both humeral and femoral lengths correlated significantly with height with the humerus showing the highest correlation with height. The right humeral length was the best parameter for sex determination among participants. A combination of the left humeral and left femoral lengths gave better prediction accuracy for tribe. Both humeral and femoral lengths are useful parameters for height, sex and tribe determination.

7   AMELIORATIVE EFFECTS OF VERNONIA AMYGDALINA PLANT EXTRACT ON HEAVY METAL INDUCED LIVER AND KIDNEY DYSFUNCTION IN RATS

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Heavy metal toxicity contributes to liver and kidney dysfunction and damage through oxidative stress mechanisms, however from previous studies, extracts from *Vernonia amygdalina* plant has shown to possess potent antioxidant properties. This study aimed at uncovering the potential ameliorative effects of ethanolic extract from *Vernonia amygdalina* plant in heavy metal toxicity induced liver and kidney dysfunction. For this study, 44 Sprague Dawley rats were divided into three groups. The control groups received basal diet and water only while the treatment groups received varied dosages of the heavy metals. The Copper (Cu) and Lead (Pb) groups had five sub-groups. The Cu ONLY and Cu Recovery sub groups were administered with 16mg/kg Cu intraperitoneally daily for 14 days whereas the Pb ONLY and Pb Recovery sub groups were administered with 13 mg/kg Pb intraperitoneally daily for 14 days. Subsequently, the Pb ONLY and Cu ONLY sub-groups were sacrificed. The three Pb and Cu treatment sub-groups received oral graded doses (100 mg/kg, 200 mg/kg, 300 mg/kg) of the extract for 21 days. The Cu recovery and Pb recovery sub-groups were left to recover for 21 days. After histological examinations, the Pb and Cu pre-treatment groups showed evidence of focal necrosis accompanied by inflammatory cell infiltrations. The serum levels of liver biomarkers AST, ALT, and GGT, as well as Urea and Creatinine were significantly elevated ($p = 0.01$) following copper and lead exposure. Upon post-treatment of the rats with the extract, the physiological levels of the biomarkers were restored and tissue architecture of the organs improved. Thus, ethanolic extract of *Vernonia amygdalina* is capable of ameliorating the effects of heavy metals toxicity through potent anti-oxidative mechanisms.

8 DETERMINATION OF HEIGHT, SEX AND FACIAL TYPES USING MORPHOLOGICAL FACIAL DIMENSIONS AND ITS RELATIONSHIP WITH TRIBE

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Facial dimensions are among the most important cephalometric indices useful in racial and sexual differentiation. In Ghana, although emphasis is placed on the face in the photographic recognition systems used in the issuance of national identification cards for health insurance, driving, voting and passports, very little published information is available on facial data, facial types and their distribution patterns and their association with tribe, sex and height. Therefore the aim of the present study was to provide detailed facial data for Ghanaians which can be used to determine height and sex. A total of 391 undergraduate students with 60% males and 40% females, aged between 16 - 36 years were recruited for the study. The height and facial parameters were measured. The results of the present study showed that males were significantly taller than females. Facial parameters were sexual dimorphic but no significant tribal-related differences were observed in facial dimensions. The predominant facial type among males and females was mesoprosopic (round face). The Akans and Ga-Adangbes were predominantly mesoprosopic (round face) whilst most of the Northerners and Ewes were euryprosopic (broad face). In the present study, morphological facial height was the single best determinant of height whilst lower facial height best predicted sex.

9 AMELIORATIVE ACTIVITY OF NATURAL COCOA ON HEPATIC INJURY CAUSED BY OVERDOSE OF PARACETAMOL ON RATS

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Paracetamol overdose is known to cause liver injuries in both humans and experimental animals. Liver damage is due to an accumulation of reactive oxygen species which impairs the antioxidants defense mechanisms, leading to increased oxidative stress. Currently, intervention of paracetamol toxicity involves the administration of N-acetyl cysteine (NAC) which serves as a glutathione precursor. Moreover, the antioxidant properties of cocoa flavanols are known to mitigate the effect of oxidative stress and concomitant tissue damage. To determine the extent of mitigation of natural cocoa on the structural and biochemical changes induced by paracetamol hepatotoxicity in rats. Twenty four male Sprague Dawley rats were weighed and randomised into four groups and given the following daily treatment for 4 weeks: group one (G1) were administered with 350 mg/kg body weight paracetamol via oral gavage and water for 24 hr; group 2 (G2) received 350 mg/kg paracetamol via oral gavage, 2% (w/v) natural cocoa powder for 12 hr and water for 12 hr ; group 3 (G3) received 350 mg/kg paracetamol via oral gavage, 140 mg/kg NAC after 4 hr and water for 24 hr; group 4 (G4) which is the control group had access to only water, for 24 hr. All rats were given standard rat chow. After week 4, all rats were weighed and sacrificed; livers were harvested and histologically processed for histomorphometric analyses. Volume densities of hepatocytes and central vein assessment were conducted using standard stereological procedures. Blood samples were collected via tail vein snipping at the commencement and termination of the experiment to determine the levels of liver transaminases (AST, ALT), and SOD as a biochemical surrogate of oxidative stress. After 4 weeks of treatment, the serum liver enzymes AST increased significantly in G1 from 122.9 ± 10.0 U/L to 416.37 ± 53.9 U/L when compared to G2 from 123.62 ± 11.9 U/L to 157.12 ± 13.4 U/L, G3 from 124.31 ± 6.4 U/L to 170.50 ± 37.1 U/L and G4 from 120.00 ± 8.0 U/L to 154.22 ± 15 U/L respectively. Liver transaminase (ALT) also increased significantly in G1 from 92.37 ± 6.4 to 160.31 ± 15.1 when compared to G2 from 90.56 ± 7.1 U/L to 108.12 ± 35.3 U/L, G3 from

91.00 ± 13.0 U/L to 92.50 ± 19.1 U/L and G4 from 93.77 ± 10.4 U/L to 114.00 ± 3.6 U/L respectively. SOD level was significantly high in G2 from 0.250 ± 0.15 U/L to 0.3991 ± 0.17 U/L; in comparison with G1 from 0.256 ± 0.18 U/L to 0.018 ± 0.01 U/L. Histomorphometric assessment in G1 indicated a significant increase (0.13 ± 0.027 ×10^{4}μm^3; p < 0.0001) in the volume of damaged hepatocytes in comparison with G2, G3 and G4 (0.017± 0.005 ×10^{4}μm^3, 0.010 ± 0.002 ×10^{4}μm^3, 0.007 ± 0.003 ×10^{4}μm^3) respectively. G1 also had the highest mean volume density of central vein (4.699 ± 1.297 ×10^{4}μm^3; p < 0.0001) in comparison with G2, G3 and G4 (1.000 ± 0.200 ×10^{4}μm^3, 1.311± 0.181 ×10^{4}μm^3, 0.886 ± 0.095 ×10^{4}μm^3) respectively. Natural cocoa powder exerts potent hepatoprotective action and increased antioxidant activity against paracetamol-induced structural and functional liver damage in male Sprague dawley rats.

10 A PRELIMINARY MORPHOMETRIC STUDY OF THE ASSOCIATION BETWEEN PLANTAR ARCH INDEX AND WEIGHT

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Plantar arch index is an important parameter for diagnosing flat foot and predicting body parts in using anthropometry. A lot of studies have been conducted in the developed world to relate plantar arch index, flat foot and body mass index. However, in Ghana, in-depth studies regarding the use of plantar arch index as a marker for weight estimation is very limited. The present study was designed to establish a possible relationship between the plantar arch index and body weight among undergraduate students of Kwame Nkrumah University of Science and Technology (KNUST). A total of 287 students with 62% males and 38% females aged between 16 - 34 years were recruited for the study. Their foot prints were taken and plantar arch index calculated using the ink print and Staheli method respectively. In addition their weight was measured. In the present study, the correlation co-efficient of the plantar arch index in males and females showed a weak but positive significant correlation with weight. Therefore, plantar arch index was not a useful model for weight estimation in the present study.

11   ASSOCIATION BETWEEN BODY MASS INDEX AND FACIAL PARAMETERS

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In developed countries, facial parameters are used for biometric and forensic purposes, in facial recognition as well as in reconstructive surgery. In Ghana, there is limited information on the craniofacial forensic database and its relationship with body mass index. Therefore, the aim of the present study was to determine the association between facial dimensions and body mass index. A total of 274 students from the Kwame Nkrumah University of Science and Technology (58.4% males; 41.6% females), aged 16 – 34 years were recruited for the study. Twenty-four facial dimensions were measured using standard techniques. The body mass index of the participants was calculated from the height and weight of participants and categorised according to the WHO system. The results of this study showed that the body mass index of the female participants was significantly higher than those of the male participants with the prevalence of obesity being higher in females than in males. The bitragal width, mandibular depth and facial width varied significantly among the body mass index categories. Therefore a change in an individual's body mass index can have a corresponding effect on his facial parameters.

12 RELATIONSHIP BETWEEN DERMATOGLYPHYICS AND SICKLE CELL DISEASE

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Dermatoglyphics have been found to play important roles in the diagnoses of chromosomal disorders and other diseases with some genetic bases. Sickle cell disease is the most commonly inherited haemoglobinopathy which may lead to various acute and chronic complications, several of which have high mortality rate. This study was aimed at generating baseline data to elucidate the possible diagnostic value of dermatoglyphics for earlier detection of Sickle Cell Disease (SCD) in Ghana. A Canoscan lide 120 Scanner was used to capture palmprints and fingerprints of 200 SCD patients from the Sickle Cell Unit of Komfo Anokye Teaching Hospital and 200 healthy individuals (control group, CG) from the School of Medicine and Dentistry - Kwame Nkrumah University Science Technology (KNUST), Kumasi. The distribution of fingerprint patterns, number of Primary creases, Intersections of primary creases and Complete transverse creases (PIC), palmar ATD, DAT and ADT angles, Absolute Finger Ridge Count (AFRC), Total Finger Ridge Count (TFRC), A-B, B-C and C-D palmar inter-digital ridge counts were studied, and the relationship determined using chi square. Ulna loop dominated in both SCD and control groups with the SCD group recording the highest. There was a significant difference for the PIC patterns with PIC 310 dominating in the SCD whilst PIC 300 dominated in the CG. The study recorded 5 unreported PIC's (PIC 400, PIC 410, PIC 430, PIC 500 and PIC 510) in the Ghanaian population. Unlike in the control group, the study did not report PIC 201, PIC 311, PIC 321, PIC 430, PIC 500 and PIC 510 in the SCD group. For the AFRC, there was a significant difference between the left hand of the SCD and control group with the SCD group recording the highest. A significant difference was recorded between the SCD and CG for A-B and C-D palmar inter-digital ridge counts with the CG recording the highest in both. There was significant difference for the ATD angle with SCD group recording the highest. Significant difference for the ADT angle was observed with the CG recording the highest. This study has established that there is significant relationship between dermatoglyphics and sickle cell disease. This will serve as a preliminary baseline data and a reliable indicator for early scientific screening and diagnosis of sickle cell disease in Ghana.

13 A PRELIMINARY ANTHROPOMETRIC ASSOCIATION BETWEEN CHEST CIRCUMFERENCE AND HIP CIRCUMFERENCE

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The size of the human body varies with respect to sex, age and race. Measurements of body parts and its relationship to one another are used in medico-legal cases, medical diagnosis and anthropological studies. Hip circumference has been used to determine the risk of developing diabetes and cardiovascular diseases. Therefore the present study sought to determine the association between chest and hip circumference measurements. A total of 263 students, aged 17-25 years, of the Kwame Nkrumah University of Science and Technology were recruited for the study. The chest and hip circumferences were measured. Results of the present study showed that females had wider hip circumference whereas males had broader chest circumference however the differences were not statistically significant. There were no differences in the measurements of the two parameters among the Akans, Ewes, Ga- Adangmes and the other tribes in the study. However, there was a weak to moderate positive, correlation between chest and hip circumferences. Although, a relationship existed between chest and hip circumferences, this relationship was limited, making estimation of one variable from the other unreliable. Therefore chest and hip circumference were not reliable markers for sex and tribe determination.

14 AN ANTHROPOMETRIC STUDY OF HAND AND FOOT DIMENSIONS AS A MODEL FOR ETHNIC SPECIFIC HEIGHT DETERMINATION

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In crime scenes, natural disasters, road traffic accidents and fire outbreaks, there is the need for identification of culprits as well as mutilated body parts. The establishment of the height and tribe of an individual, among forensic scientists and anthropologists, have become a necessity for identification for which different body parts have been used. Due to the dynamism of populations resulting from differences in the nutrition, heredity, ethnicity and occupation, this study aimed to determine the inter-ethnic differences existing for hand and footprint dimensions and further provide ethnic specific models for height estimation. A total number of 413 students from selected tertiary institutions consisting of Ashantis (41.89%), Fantes (15.01%), Ewes (13.32%), Northerners (12.11%), Gas (6.78%), Akuapem (6.54%) and Bonos (4.36%). Ethical approval and participants' informed consent were sought. Palmar and plantar surfaces were scanned and measurements of toe-heel lengths, breadth at heel, breadth at ball, palm length, palm breadth and digits lengths were recorded. Among the males, the right and left 3rd and 4th digit lengths, and right palm breadth exhibited inter-ethnic differences. On the part of females, with the exception of right and left palm breadths, all the measurements of the hand exhibited inter-ethnic differences. Also, all the foot dimensions except the right 1st toe – heel length in the males exhibited inter-ethnic differences. The right and left 5th toe – heel lengths and the left breadth at ball were the only footprint dimensions that showed inter-ethnic diversity among the females. The combination of hand and foot dimensions explained 52.9%, 76.2%, 59.1%, 80.6%, 81.2%, 58.4% and 62.3% of the height of Ashantis, Northerners, Akuapems, Bonos, Gas, Fantes and Ewes respectively. The present study has provided preliminary ethnic specific baseline data on foot and handprint dimensions for identification purposes.

15 A PRELIMINARY ANTHROPOMETRIC STUDY OF THE ASSOCIATION BETWEEN SELECTED BODY SEGMENTS AND HEIGHT

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The relationship between height and the dimensions of various body segments is of great value in medico-legal investigations, anthropology and forensic science. Therefore the study was designed to assess the relationship between height, neck circumference, waist circumference, hip circumference, waist to hip ratio and foot dimensions. Two hundred and sixty-one students of the Kwame Nkrumah University of Science and Technology Kumasi, aged between 16 – 34 years, were recruited for the study. The height, neck circumference, waist circumference, hip circumference and foot dimensions were measured and the waist to hip ratio calculated. Results of the present study showed that Foot length had a higher correlation with height than foot breadth. Also, height correlated significantly with all circumference measurements except hip circumference. In addition, foot length and breadth exhibited sexual dimorphism. Height was also estimated using simple linear regression and stepwise multiple regression from foot dimensions and hip measurements. The simple and multiple regression models derived in the present study are useful for the estimation of height.

16 CAN ULTRASOUND BE USED AS A POST MORTEM TOOL?

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The use of ultrasound imaging in post mortem studies has been limited as a result of post mortem changes including decomposition and gas formation. Knowledge on the time interval within which useable images can be formed using ultrasound imaging on post mortem tissue has not been studied extensively. Therefore, the aim of this study was to determine the period within which ultrasonic anatomy of cadaveric tissue produced usable images. Serial measurements of body temperature, pH and tissue biopsies of the liver and thigh muscles were taken at two-hourly intervals for 12 hours, then four hourly intervals for 24 hours and finally extended to 8-hourly intervals for the next 72 hours from euthanized West African Dwarf Sheep. Ultrasound images were obtained by scanning the liver and thigh muscles, and the images were further processed for greyness using 'Image J software'. The measured attenuation coefficient of the skeletal muscle showed significant anisotropy as a result of the influence of physical changes that characterize the postmortem period. The study revealed that decomposition is faster in the liver than in skeletal muscle. Microscopic and ultrasound morphology of skeletal muscle and liver was preserved until 24 hours after death. Therefore, ultrasound imaging provides a noninvasive and nondestructive means of detecting a variety of meaningful findings at post mortem. Ultrasonography could also provide an additional tool in the teaching of gross anatomy and help reduce the potential health and safety biohazards of staff members and students in the dissection room.

17 A PRELIMINARY STUDY ON THE ASSOCIATION OF ANTI- MULLERIAN HORMONE (AMH) WITH THE QUALITY OF OOCYTES IN IN VITRO FERTILISATION (IVF) CLIENTS IN GHANA

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Anti-Mullerian Hormone (AMH) derives its name from its function of causing regression of the Mullerian duct in the female reproductive tract. Although the measurement of AMH routinely precedes almost every Assisted Reproductive Technology (ART) cycle in current practice, there is more to AMH than just the prediction of ovarian response. The hormone is the first molecule to be synthesized and secreted by sertoli cells at the time of seminiferous tubule organization. AMH is a glycoprotein of the transforming growth factor-beta (TGF-β) super family and it is produced by granulosa cells from 36 weeks of gestation until menopause. The ability to measure the concentration of AMH is a distinct added tool in daily practice in ART: the ability to indicate ovarian reserve and predict ovarian response to stimulation. The positive consequences being improved planning of ovarian stimulation protocols, increased safety and efficiency, as well as aiding in the counselling of clients. However, AMH measurement has not correlated with rates of oocyte maturation and quality. Although serum AMH levels are being used as a quantitative biomarker for ovarian reserve, its ability to determine oocyte quality remains uncertain. Therefore the aim of the study was to determine the association between serum levels of AMH with the quality of oocytes in *in vitro* fertilization (IVF) patients in Ghana. Thirty nine clients undergoing their first IVF treatment were prospectively recruited according to the following criteria: regular menstrual cycles (25-35 days); presence of both ovaries; no evidence of endocrine disorder (normal thyroid stimulation hormone, prolactin, testosterone and androstenedione); aged 18 - 45 years and written participant consent. On day three of the spontaneous menstrual cycle within 3 months preceding IVF treatment, a venous blood sample was obtained for the measurement of AMH levels with Cobas e411 using electrochemiluminescence immune assay (ECLIA)

for the *in vitro* quantitative determination (ng/mL of protein). After controlled ovarian stimulation (COS), the oocytes were retrieved and their quality assessed for the presence of the first polar body using a stereo microscope. Oocytes were inseminated with their partner's sperm and the number of fertilized oocytes assessed after 15-18 hours. Treatment outcomes were analysed according to AMH percentiles based on the AMH normogram (0.3 – 4.0 ng/mL) used for stratifying female infertile population per patient's age. Multivariate analyses were performed to adjust for potential confounding factors such as age, total exogenous follicle stimulating hormone (FSH) dosage and number of eggs retrieved. Preliminary results obtained showed that women (> 40 years of age) with very low (below 0.3 ng/mL) or undetectable AMH values and less than 25th percentile have poor quality oocytes, have less chances of having an embryo transferred, lower chances of having an ongoing pregnancy per started IVF cycle and a lower embryo freezing rate compared with patients with normal reference population (0.3 – 4.0 ng/mL).

18 ANTHROPOMETRIC STUDY OF HEIGHT AND SEX DETERMINATION USING AURICULAR AND TRAGAL RELATED MEASUREMENTS AND ITS ASSOCIATION WITH TRIBE

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Cephalometry is a simple noninvasive process often used in forensic science and plastic reconstructive surgery. Also cephalometric parameters such as auricular and tragal dimensions can be used for stature estimation and differentiation of sex, race and tribe. However, there is very limited data on auricular and tragal related measurements of Ghanaians which can incur a lot of challenges during the identification of an individual most especially in a crime scene as well as natural disasters. Therefore the present study aimed at generating baseline data on auricular and tragal related dimensions of the face and its correlation with height and sex among the Akans, Ewes, Ga-Adangbes and other tribes in Ghana. A total of 252 parrticipants with 60% males and 40% females aged between 16-25 years were recruited for the study. Height, four auricular and nine tragal related dimensions of the participants were measured. The tribe of each participant was also recorded. Generally, males recorded significantly higher auricular and tragal related measurements than females. Among all the auricular and tragal related measurements, only the left orbito-tragal measurement recorded a significant difference among the various tribes. Auricular and tragal related measurements showed weak positive correlation with height irrespective of sex. The overall sex prediction accuracy using auricular and tragal related dimensions was 59.1% and 73.4% respectively. These results can be used for forensic purposes and reconstructive surgery in Ghana and serve as baseline data for further studies.

19 A STUDY OF HEIGHT AND SEX DETERMINATION USING PERCUTANEOUS CLAVICULAR LENGTH AND ITS ASSOCIATION WITH TRIBE

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Osteometric indices have a direct relationship with sex, height, age, and race of an individual. These factors are basic in the identification of an individual. In Ghana, there are very few reports on the use of bones for personal identification as compared to the developed world. Therefore the present study sought to use percutaneous clavicular length as a model for height and sex determination. Two hundred and thirty-seven undergraduate students of Kwame Nkrumah University of Science and Technology, Kumasi with 60.3% males and 39.7% females between the ages of 16 - 33 years were recruited for the study. The total standing height and clavicular length were measured. In the present study, males were significantly taller than females. The clavicular length was bilaterally asymmetric in both males and females. Inter-ethnic differences in clavicular length were not statistically significant. In addition, clavicular length exhibited a moderate correlation with stature. The length of the clavicle in the present study could not serve as a reliable parameter for height estimation. However, it was a good predictor of sex with an overall accuracy above 80%. The clavicular length of Ghanaians was significantly different from those of Iranians and Indians.

20 A PRELIMINARY ANTHROPOMETRIC STUDY OF THE ASSOCIATION BETWEEN ARM SPAN MEASUREMENT, HAND AND FOOT DIMENSIONS

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Hand and foot anthropometry is important to the identification of unknown persons as they narrow the possibility of identification by about 50%. Hand and foot dimensions have been reported to correlate with armspan. However, the existence of inter-population differences suggest the need to establish population specific data for the Ghanaian population. Thus, the present study was aimed at generating detailed baseline data on hand and foot dimensions and their relationship with armspan amongst students of the Kwame Nkrumah University of Science and Technology. A total of 233 undergraduate students with 42.5% females and 57.5% males aged between 16 - 34 years were recruited for the study. Hand dimensions, foot dimensions and arm span were measured. Males recorded significantly higher mean values for arm span, foot and hand dimensions than the female participants. There was a significant positive correlation between arm span length and foot dimensions as well as arm span length and hand dimensions. However, foot dimensions exhibited higher correlation with arm-span length as compared to the measured hand dimensions. Foot dimensions were better predictors of arm span length than hand dimensions. The results of the present study provide baseline data for further studies.

21 DETERMINATION OF HEIGHT, SEX AND TRIBE USING PERCUTANEOUS MEASUREMENTS OF RADIUS AND FIBULA

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Age, sex, height and race are vital factors in the identification of a person in mass disasters. Although many formulae for height and sex determination have been derived from long bones worldwide, there is a need to develop population specific formulae for different populations. However, currently Ghana has very few reports on osteometric indices for personal identification. Therefore the present study aimed at determining height and sex using radial and fibular length amongst Akans, Ewes, Ga-Adangmes and "Other tribes". Two hundred and ninety-eight undergraduate students of the Kwame Nkrumah University of Science and Technology, Kumasi with 57.7% males and 42.3% females aged between16 to 34 years were included in the study. Radial and fibular lengths and height of all participants were recorded. Males were significantly taller than females. Radial and fibular lengths were significantly higher in males than in females. Ga-Adangmes were the tallest whilst Akans were the shortest amongst the population. Fibular length was a better index for estimating height whilst radial length was the better index for determining sex in the present study. Therefore radial and fibular lengths can serve as preliminary useful tools for height and sex determination.

22 MORPHOMETRIC STUDY OF PLANTAR ARCH INDEX AND THE PREVALENCE OF FLATFOOT AND ITS RELATIONSHIP WITH TRIBE

Yelevuuro, F. D. Abaidoo, C. S., Tetteh, J., Darko, N. D., Appiah, A. K., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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Flatfoot (pes planus) is the commonest foot deformity caused by the absence or collapse of the medial longitudinal arch. Flatfoot results in serious health problems and postural defects. It is highly variable in different population with many factors associated. This study was conducted to find the plantar arch index and the prevalence of flatfoot and its relationship with tribes. A total of 278 participants (172 males and 106 females) with ages ranging from 16 to 34 years were recruited for the study. Ethical approval and informed participants' consent were sought prior to the study. Participants were drawn from Akan tribe, Ewe tribe, Ga-Dangbe tribe and other tribes (Dagomba, Dagabaa, Frafra, Gonja, Wale Wale). Foot imprints were taken from each participant using the ink method. The plantar arch index was calculated using the ratio of the width of the central and the heel region of the footprint. The mean right plantar arch index was higher than the left. The prevalence of flatfoot was 15.1% (6.1% unilateral left, 5.8% unilateral right and 3.2% bilateral). The prevalence rate was 15.7% in males and 14.1% in females. The prevalence rates reported for the Ga-Dangbes and Ewes were 30.8% and 23.6% respectively. On the hand, the Akans and other tribes recorded the same prevalence of 13.7%. Flatfoot was found to be high among the Ga-Dangbes. Ethnicity as an external factor has a great role in influencing foot arch structure. Also, sex has an influence on the morphology of an individual's foot.

23 QUANTITATIVE ASSESSMENT OF THE HAND AND ITS RELATIONSHIP WITH TRIBE

Nyarko, E. F. Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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The human hands aside being one of the most preferred part of the body for anthropometric measurements, is also known to be important for human interactions, nonverbal communication and social integration. Several studies involving the use of hand dimensions to predict sex and stature have been done across different populations. Limited studies have been done to assess the relationship between hand dimensions and tribes in Ghana hence this study was designed to investigate the tribal differences in hand dimensions in the Ghanaian population. A total of 355 participants between the ages of 16 and 34 from the Kwame Nkrumah University of Science and Technology, School of Medicine and Dentistry (KSMD), were recruited for this study. Informed participant consent and ethics committee approval were sought. Various hand measurements of participants were taken. Male participants recorded significantly larger hand dimensions than female participants. Bilateral differences in hand measurements were observed for most of the hand dimensions measured in both sexes. With the exception of thumb length, palm length, palm breadth and hand length, males and females of "other tribes" recorded larger hand dimensions which was not significant. There was no statistically significant difference between hand dimensions measured among various tribes employed in the study. Hand dimensions of participants in this study were significantly larger than that of Slovaks and Malaysians. Hand dimensions employed in this study are not useful tools for differentiating tribe.

24 A PRELIMINARY ANTHROPOMETRIC STUDY OF THE RELATIONSHIP BETWEEN MID-UPPER ARM CIRCUMFERENCE AND HAND MEASURMENTS

Addo, F. A., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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Hand measurements and mid-upper arm circumference are of great importance to scientists especially in the field of forensic anthropometry. These anthropometric indices have been employed in the determination of sex, height and malnutrition status among immunocompromised patients, pregnant women and children for clinical purposes in many developed countries but less utilized in Ghana. Therefore, the present study was conducted to assess the relationship between mid-upper arm circumference and hand measurements among undergraduate students of the Kwame Nkrumah University of Science and Technology, School of Medicine and Dentistry (KSMD). Ethical approval and participant's consent were sought prior to the study. Participants comprising 172 males and 119 females were recruited for the study. Measurements of the hand and mid-upper arm circumferences were taken. All the mean values of measurements were statistically greater in males than females. Apart from the right hand breadth that recorded correlation coefficient of 0.3 with right mid-upper arm circumference, all other hand dimensions recorded values less than 0.2. The study found the relationship between mid-upper arm circumference and hand measurements to be very weak.

25 A PRELIMINARY ANTHROPOMETRIC STUDY OF ARM-SPAN AND PERCUTANEOUS CLAVICULAR LENGTH FOR HEIGHT AND SEX DETERMINATION

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Human height varies widely across the world. The study of long bones such as the arm and clavicle and their relationship with height and sex has been of limited focus in Ghana. The present study was designed to assess the relationship between arm-span, clavicular length, height and sex. 181 participants were involved in this study, 108 (59.7%) were males and 73 (40.3%) were females, aged between 16 – 33 years. The height, clavicular length and arm-span length were measured. Males were significantly taller than females. The arm-span length was longer in males than in female participants. Males recorded significantly longer right and left clavicular length than that of females. Right clavicular length was a better predictor of sex. All measured parameters correlated with height, with the clavicular length of both left and right in both sexes showing weak and moderate significant correlation respectively. Arm-span showed a strong correlation with height, proving to be a better predictor of height. Linear regression equations were derived to estimate height using arm-span length and clavicular length.

26 AN ASSESSMENT OF TORSO LENGTH IN RELATION TO HEIGHT

Boamah, G. Y., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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A lot of work has been done on the anatomical estimation of height using anthropometric studies for identification purposes. However, early studies focused on skeletal remains and cadavers to derive formulae for height estimation. Also, not much work has been done in the Ghanaian population, especially with regards to torso measurements. Therefore, this study sought to formulate models for height estimation by using the torso length of a living population. The study recruited 273 undergraduate students from the Kwame Nkrumah University of Science and Technology, School of Medicine and Dentistry (KSMD) comprising 165 males and 108 females. The height and torso lengths of the participants were measured. Analysis was done using IBM SPSS version 20.0. Males were significantly taller than females in the present study. Male participants recorded numerically longer mean torso length than the females, but the difference was not statistically significant. There was a positive weak significant correlation between torso length and height of males, but that of females was not statistically significant. Therefore, torso length appears to be an unreliable parameter for height estimation in this present study owing to its low prediction accuracy.

27 DETERMINATION OF HEIGHT AND TRIBE USING PERCUTANEOUS MEASUREMENT OF TIBIA AND FIBULA

Kwarteng, A., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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The height of an individual is considered as one of the vital parameters for human identification. There are very few reports in Ghana on the use of percutaneous measurements of tibia and fibula for height and tribe determination as compared to the developed countries where well established osteometric data exist. The present study aimed at determining the height and tribe of Ghanaians using percutaneous measurements of tibia and fibula. A total number of 226 healthy undergraduate students from the Kwame Nkrumah University of Science and Technology, School of Medicine and Dentistry (KSMD) made up of 135 males and 91 females and within the age range of 18-30 years were recruited for this study. Parameters measured were height, tibiae and fibulae lengths. The results revealed that, males were significantly taller and had longer tibia and fibula lengths than females. Percutaneous tibia length showed the strongest correlation with height. Regression formula was derived for the estimation of height from the percutaneous measurement of tibia and fibula. There was no significant inter-tribal difference between the tibia and fibula lengths. Mean tibia and fibula lengths were significantly different when stratified with sex. Height but not tribe can reliably be estimated using the percutaneous measurement of tibia and fibula.

28 A MORPHOMETRIC STUDY OF DIGIT AND CLAVICULAR LENGTH FOR HEIGHT ESTIMATION

Dason, A.-R. Y., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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Height estimation is one of the significant indices utilized in the field of anthropology and forensic science. Digit and clavicular lengths have been used to estimate height in most developed countries. However, there appears to be limited data involving the use of either the digit or clavicular lengths to estimate height among the Ghanaian population. Therefore, the present study was undertaken to estimate height using regression models that included human digits and clavicular lengths. A total of 230 undergraduate students from the Kwame Nkrumah University of Science and Technology, School of Medicine and Dentistry (KSMD) consisting of 137 males and 93 females and aged of 16 - 28 years were recruited for the study. Informed participants' consent and ethical approval were sought prior to the study. Measurements taken were height, digit and clavicular lengths. Males were significantly taller than females. Generally, males had significantly longer digits and clavicular lengths than female participants. Height correlated significantly with all the digit lengths in both sexes except the thumb of the left hand and little finger of both right and left hands in males. Height also correlated significantly with the right and left clavicular lengths in both sexes. The best determinants of height in males were the right middle finger length and right clavicular length. Left ring finger length and left clavicular length were the best determinants of height in females. Clavicular length was the overall best determinant of height.

29 ASSOCIATION BETWEEN DERMATOGLYPHICS, BLOOD GROUP AND SEX

Atuahene, B., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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Amongst the number of parameters available for establishing the identity of an individual, fingerprints are considered to be the most precise and reliable indicator of personal and sex identification.   In Ghana, there is limited documentation on the relationship of fingerprint ridge density of males and females, although some studies have proposed a possible correlation between the two. This study therefore sought to determine the relationship between fingerprint ridge density, blood group and sex in a Ghanaian population. The study was conducted at the Department of Anatomy, School of Medicine and Dentistry, Kwame Nkrumah University of Science and Technology using 200 participants (129 males and 71 females) aged 18 – 31 years. Fingerprint, sex and blood group were taken. Males recorded a lower mean ridge density than females. The predominant blood group was blood group O followed by B, A and then AB.   The index, middle, ring and little fingers of A, B, AB and O blood groups showed high frequency of loops followed by whorls, and then arches. Ridge densities of female participants of blood groups A, B and O were significantly higher than those of the males. This shows that, ridge density may be useful in sex determination.

30 ANTHROPOMETRIC STUDY OF HEIGHT AND SEX USING ARM SPAN AND ITS ASSOCIATION WITH TRIBE

Oppong, B., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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Arm span has been reported to have a significant correlation with height and sex of a person and is therefore used for personal identification in most developed countries. However, there appears to be limited information on the arm span measurements in Ghana. Therefore, the aim of this study was to determine the sex and height of individuals using arm span and its association with tribe among Ghanaian KNUST students. The study recruited 297 undergraduate students between the ages of 16 and 34 years. The height and arm span of the participants were measured. Data was subjected to statistical analysis using Statistical Package for Social Sciences (SPSS). In this study, male participants were significantly taller than females. Males also had a significantly longer arm span than females. Both Height and arm span measurements showed no significant variation among the various tribes used in the present study. A strong correlation between height and arm span measurements among males and females was observed. Arm span length was a moderate predictor of height but a strong predictor of sex. Interpopulation studies of arm span showed that Ghanaian arm span measurements vary significantly with that of Ethiopians, Indians, Taiwans, and Montenegrins.

31 DETERIMINATION OF HEIGHT AND SEX USING PERCUTANEOUS MEASUREMENTS OF ULNA AND RADIUS

Asare, B., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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Height is the most important and useful anthropometric parameter which is useful in the identity of an individual. Sexing of an individual can also be used to narrow down the identity of a person especially in mass disasters or from skeletal remains. Though forensic anthropology and its application has reached its peak in developed countries, Ghana remains underdeveloped in this area due to inadequate data which can be used to derive models for determination of sex and height using ulnar and radial lengths. A total of 215 undergraduate students (124 males and 99 females) from the College of Heath Sciences, Kwame Nkrumah University of Science and Technology were recruited for the study and the data was analysed using Statistical Package for Social Sciences (SPSS) version 20.0. The height, ulnar and radial lengths of males were significantly higher than that of females. In males, the left and right sides of both the ulna and radius were bilaterally asymmetrical in terms of length. In females, the left and right ulnae were bilaterally symmetrical but with the radii showing asymmetry. In both males and females, the highest correlation was observed between height and right ulnar length and hence was the best estimator of height. Similarly, the right ulnar length was the best predictor of sex.

32 HEIGHT AND SEX DETERMINATION USING HAND DIMENSIONS AND THE RELATIONSHIP WITH TRIBE

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The past two decades have seen a gradual increase in the literature devoted to the anthropometry of the human body. Studies involving the anthropometry of the hand have been conducted across different populations. However, only few studies have determined the height and sex of a person using hand dimensions. This study was designed to estimate height and sex using hand dimensions in the Ghanaian population and the relationship with tribe. A total of 345 undergraduate participants from the Kwame Nkrumah University of Science and Technology students of the School of Medicine and Dentistry (KSMD) with ages from 17 to 34 were recruited for the study. Hand measurements were taken as well as the heights of the participants. Males were taller than females. Males had significantly longer hand dimensions than females. Ewe males were the tallest amongst the male participants whilst the females from the "other tribes" were the tallest amongst the female participants. There was no statistically significant difference in the hand dimensions amongst the various tribes. The right middle finger was the best predictor of height in males whilst the left hand length was the best predictor of height in females.

33 HEIGHT AND SEX DETERMINATION USING FOOT DIMENSIONS AND THEIR RELATIONSHIP WITH TRIBE

Sarkodie, P. S., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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Challenges are encountered in stature and sex determination of bodies dismembered during mass disasters. A close relationship exists between height, sex and dimensions of various body segments which is of immense value in medico-legal investigation. The present study sought to provide more reliable data on the use of foot for identification in Ghana which could be of great help to forensic scientists. This cross-sectional study was carried out on 307 participants (177 males and 130 females) who were students of the Kwame Nkrumah University of Science and Technology (KNUST). The heights and feet of the participants were measured. Simple linear regression equations were generated and stepwise binary logistic regression was used to find a model that could determine sex better. Height was best estimated using the left foot breadth at ball measurement. Sex was best determined using; breadth at ball for the left, breadth at heel for the right and left pternion-toe 1 length. The findings in the present study suggested that foot dimensions were very useful in determining the height and sex in individuals and it is therefore useful for forensic purposes.

34 RELATIONSHIP BETWEEN MID-UPPER ARM CIRCUMFERENCE, HEIGHT AND TOTAL FACIAL HEIGHT

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The total facial height and mid-upper arm circumference have been observed to have substantial correlations with height. Estimation of height is indispensable in forensic examination especially in situations in which unknown highly decomposed and mutilated body parts of humans need to be identified. Also, in hospitalized bedridden individual's height estimation could help in the calculation of nutritional indices and standardization of physiological parameters. The aim of the present study was to determine the relationship between mid-upper arm circumference, height and total facial height. This cross-sectional study involved 306 (183 males and 123 females) undergraduate students of the Kwame Nkrumah University of Science and Technology aged 16 to 34 years. Height, mid-upper arm circumference and total facial height measurements were taken. Statistical analysis was done using Statistical Package for social sciences (SPSS) version 20.0. It has been shown in the present study that males are significantly taller than females. Also, males have significantly higher total facial height than females. The recorded mid-upper arm circumference showed no sexual dimorphism. Total facial height had a stronger correlation with height and was a better predictor of height as compared to the mid-upper arm circumference. This study has provided preliminary baseline information for the general Ghanaian population.

35 DETERMINATION OF HEIGHT, SEX AND TRIBE USING PERCUTANEOUS ULNAR AND TIBIAL LENGTH

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Globally, forensic anthropologists have seen a significant increase in their workload due to the high occurrence rates of natural and man-made disasters. Variations resulting from intra-population and inter-population differences in lifestyle, nutrition and cultural beliefs, necessitates the establishment of population-specific standards using osteometric methods. Although various researches have been conducted in some populations, very few published works exist for studies done within the Ghanaian population. The aim of the present study was to use the percutaneous measurement of the Ulna and Tibia as models for height and sex determination. The study was conducted at the Kwame Nkrumah University of Science and Technology, School of Medicine and Dentistry on 293 students (170 males and 123 females) from the College of Health Sciences with ages ranging from 16-34 years. Stature, ulnar and tibial length on both sides were measured in standard position and analysis was done using SPSS version 22. Males were found to be significantly taller than the female participants. The ulnar and tibial lengths of males were significantly longer than that observed in female participants. Mean ulnar and tibial lengths of the study population differed significantly from those reported for Iranians, Nepalese and Indians. The tibial length was a better index for determining height and sex than the ulnar length in both male and female participants. The ulnar and tibial lengths can serve as preliminary useful tools for height and sex determination.

36 ASSESSMENT OF THE RELATIONSHIP BETWEEN ARM SPAN, UPPER EXTREMITIES, LOWER EXTREMITIES WITH HEIGHT

Sakyi, S. K., Abaidoo, C. S., Darko, N. D., Appiah, A. K., Tetteh, J., Diby, T. Okwan, D., Adjei-Antwi, C., Nketsiah, J., Robertson, J. and Bempah, S.

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Anthropometric indices have a direct relationship with sex, height, age and race of an individual. These factors play a vital role in the identification of an individual. There are very few reports in Ghana on the use of bones for personal identification as compared to the developed world. Therefore, the present study sought to use the arm span, upper and lower extremities as models for height and sex determination. Two hundred and forty-four undergraduate students of the Kwame Nkrumah University of Science and Technology, of which 144 were males and 100 females aged 18 - 33 years were recruited into the study. The total standing height, arm span, lower and upper extremities lengths were measured. The data was analysed using excel version 2013 and SPSS version 20.0. In the present study, males were significantly taller than females ($p < 0.05$). Arm span, lengths of lower and upper extremities were significantly higher in the male participants than in the females. Lengths of the upper extremities correlated strongly with height whereas that of the lower extremities was weak. Arm span and upper extremities were the most reliable indices for estimating height in the participants. Therefore, arm span and lengths of upper extremities can serve as useful tools for height determination.

37 ASSOCIATION BETWEEN BODY MASS INDEX, HAND AND FOOT DIMENSIONS

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Human hand and foot have been shown to be significant parameters for height estimation globally. Obesity has turned into a worldwide epidemic, estimation of body mass index by height and weight measurement is almost impossible especially among patients in the critical care unit hence making it difficult to monitor their body fat. Therefore, the present study sought to determine the association between body mass index, hand and foot dimensions. A cross-sectional survey was conducted at the Kwame Nkrumah University of Science and Technology among 314 undergraduate students which comprised of 181 males and 133 females. Ethical approval and informed participant consent were sought prior to the commencement of the study. Data taken from students included; age, sex, height, weight, bilateral hand and foot dimensions and family history of diabetes. Normal BMI was observed in 71.3% students, 15.9% students were overweight, 7.0% underweight and only 5.7% were obese (72.7% females and 27.8 males). Females recorded a significantly higher body mass index as compared to males. Also in this study, hand dimensions correlated positively and significantly to height. Hand and foot dimensions have been observed to be significant markers for height estimation but not body mass index in the present study.

38 CHALLENGES IN THE MANAGEMENT OF CAROTID CARVENOUS FISTULA IN GHANA; THE WAY FORWARD

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Carotid-cavernous fistula is an abnormal communication between the carotid artery and the cavernous sinus. The fistula is classified based on etiology, haemodynamic and anatomical configuration. The most common type which is the direct high flow fistula results from trauma. Indirect fistula which is less common results from underlying conditions such as hypertension, collagen vascular diseases, pregnancy amongst others. This is a report on a rare case of a forty-year old woman with the spontaneous type D indirect carotid cavernous fistula with rapidly progressing symptoms who was referred abroad for intervention due to unavailability of such services in the facility and country.

39 A HISTOMORPHOLOGICAL STUDY OF BREAST DISEASES SEEN AT THE KOMFO ANOKYE TEACHING HOSPITAL, KUMASI

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Breast diseases constitute a significant public health problem globally, especially in developing countries. Every year, approximately half a million new cases of breast diseases such as breast cancer are reported globally, 80% of which occurs in developing countries, where it is the leading cause of cancer-related death among women. The morphological categorization of breast diseases is important for their management. Therefore, this study was conducted to throw more light on the age specific incidence of the various breast diseases among the patients attending the Breast Clinic at the Komfo Anokye Teaching Hospital in 2014. A total of 463 specimens from females aged 11 – 92 years were processed, sectioned and stained for light microscopy. The WHO classification of breast diseases was used in classifying the specimens. The incidence rate of breast cancer in 2014 at KATH was 40.0%, with a mean patient age of 48.80 ± 13.77 years. Invasive ductal carcinoma constituted 95.1% of all cases of breast cancer with a peak age of 40 – 49 years. Several benign breast diseases which are precursors for breast cancer such as duct hyperplasia, fibrocystic disease, granuloma tissue, tubular adenoma, phyllodes tumour, chronic abscess, chronic inflammation, duct papillomatosis, duct ectasia and glandular adenoma were identified in women within the age group of 20 – 29 years. Therefore there should be nationwide education and regular screening programmes for breast cancer to help increase awareness and reduce the increasing incidence of the disease.

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