**Reviewer's report**

**Title:** Estimation of stature from foot and its segments in a sub-adult female population of North India

**Version:** 1  **Date:** 29 September 2011

**Reviewer:** Wesley Vernon

**Reviewer's report:**

Estimation of stature from foot and its segments in a sub-adult female population of North India*

Authors:
Kewal Krishan, MSc, PhD
Tanuj Kanchan, MD
Neelam Passi, MSc (Research Scholar)

W Vernon review comments

The paper sets out to define standards for the estimation of stature utilising the foot in a sub-adult female population in Northern India. The conclusions are that there is no statistically significant bilateral asymmetry between left and right feet although such differences did exist when comparing breadth measurements. A positive and statistically significant correlation was found between stature and all foot measurements in the population studied and multiple regression as opposed to linear regression models were found to provide the more accurate estimation of stature.

The paper is clearly presented, logically laid out and the issue being considered is well explained. Although the paper has been produced by an anthropological team and focused on a specific population it will be of undoubted interest to podiatrists, specifically those involved in the new and rapidly developing field of forensic podiatry. In this sense, the value of the work is clearly explained. The findings have the potential to stimulate interest in the field and in the approaches reported and may lead to further research on other population types.

While the area reported by the authors (estimation of stature from foot/footprint dimensions) has been considered by others, variations of understanding are apparent within this previous work. Further work in this general area is therefore welcomed. The very specific population involved in this paper has not been studied before in this context and the authors question is both clear and novel. The methods described do appear to be appropriate and well described in enough detail to enable others to reproduce the work and also to apply this approach to other populations. The data too appear to be controlled well and the rigour used by the research team is clearly apparent from the descriptions
provided and through the general layout and clarity of the manuscript. Sources of error are clearly stated. The results and discussion are justifiably presented together and are clear and considered.

Although I am not a statistician, to my limited understanding, the statistical analysis does seem acceptable. I would however recommend seeking comment from a statistician on this particular aspect of the paper.

The conclusions appear to be justified from the data presented and importantly are stated to relate to the very specific population studied (the sub-adult female population of North India) as clearly noted in the title and abstract. While the paper does state this limited context of applicability, there is the potential to make this even more explicit within the concluding section of the paper and I would recommend that the authors do make this point even more explicit than they have done already.

The writing is mainly clear, however a number of minor amendments are required to the use of the English language in some sections of the paper as noted below.

These suggested amendments follow and should be considered as minor compulsory revisions:

Title
“Estimation of stature from foot and its segments in a sub-adult female population of North India”.
Change to “Estimation of stature from the foot and its segments in a sub-adult female population of North India”

Background
“Establishing personal identity is one of the main concerns in forensic podiatry investigations”.
Change to “Establishing personal identity is one of the main concerns in forensic investigations”. (i.e. delete podiatry)

Abstract
“The objective of the present study was to set up standards for estimation of stature from foot and its segments”
Change to: “The objective of the present study was to set up standards for estimation of stature from the foot and its segments”

“The results indicate that statistically significant side differences occur…”
Please explain “side differences” (e.g. The results indicate that statistically significant differences between left and right feet occur…”)

“The present study concludes that the foot measurements have a strong relationship with stature in the sub-adult female population of North India”
Change to: “The present study concludes that foot measurements have a strong relationship with stature in the sub-adult female population of North India” (i.e. delete “the” from “the foot”).

“The regression models derived in the study may be applied successfully for estimation of stature in sub adult females”

Change to: “The regression models derived in the study may be applied successfully for the estimation of stature in sub adult females”

Background

“Forensic podiatry is the study of examination of every kind of foot related evidence in criminal investigations and legal context”

Forensic podiatry is not every kind of foot related evidence. Please either use the formal definition of forensic podiatry as provided by Vernon & McCourt (1999), or a summary of the main points of this formal definition.

“One of the main tasks of forensic podiatrists is to establish the personal identity in forensic investigations.”

Change to: “One of the main tasks of forensic podiatrists is to contribute to the establishment of personal identity in forensic investigations.”

“The need to establish identity of dismembered remains may arise in cases of mass disasters”

Change to: “The need to establish the identity of dismembered remains may arise in cases of mass disasters”

“..the pool of possible victim matches in forensic investigation process”

Change to: “..the pool of possible victim matches in the forensic investigation process”

“The forensic identification from foot and its parts are important as there is an increased likelihood of recovery of feet”

Change to:” Forensic identification from the foot and its parts are important as there is an increased likelihood of the recovery of feet”

“The significance of human foot and its bones”

Change to: “The significance of the human foot and its bones”

“…and the use of radiographic comparisons of foot [17-21] confirms the importance of foot in identification.”

Change to: “…and the use of radiographic comparisons of the foot [17-21] confirms the importance of the foot in identification.”
“less commonly in the sub-adult cases”
Change to: “less commonly in sub-adult cases”

“the formula derived for stature estimation in adult population cannot be applied on the sub-adults”
Change to: “the formula derived for stature estimation in the adult population cannot be applied to sub-adults”

“The present study on the estimation of stature from foot and its segments”
Change to: “The present study on the estimation of stature from the foot and its segments”

Methods

“Majority of the individuals from these caste groups are engaged in agriculture, and animal husbandry.”
Change to: “The majority of the individuals from these caste groups are engaged in agriculture, and animal husbandry.”

“Thus, the subject was made to stand in an erect posture without any wear on head and foot”
Change to: “Thus, the subject was made to stand in an erect posture without any headgear or footwear being worn.”

“For recording foot measurements, the subject is made to stand”
Change to: “For recording foot measurements, the subject was made to stand”

“It is the distance taken from the lateral side of the heel (ctu.l) to the medial side (cc.m) of the heel.”
Change to: “The distance taken from the lateral side of the heel (ctu.l) to the medial side (cc.m) of the heel (for reasons of consistency)”

“Measurements were recorded in centimeters to the nearest millimetre”. This appears contradictory. Change to “Measurements were recorded to the nearest millimetre.”

Technical/measurement error

“The same formula was applied to the left-right differences”
Change to: “The same formula was applied to the left-right foot differences”

“The technical error within side and between sides is described as the ‘S2 within
side’ and ‘S2 between side’”

Please be explicit as to what is meant by “side” here to help the reader (e.g. could you say “The technical error within the measurements taken from each foot (left or right) and between each of these feet is described as the ‘S2 within foot’ and ‘S2 between foot’”?)

“Hence, the variation due to sides is several times larger than the measurement error, indicating that measurement error contributes but little to the difference between sides.”

As above. Could this sentence be re-worked on the lines of: “Hence, the variation between left and right feet respectively is several times larger than the measurement error, indicating that measurement error contributes little to the apparent difference between left and right feet.”

“Our findings indicate that the technical error contributes negligible to the measurements and the measurements are reproducible without significant technical error.”

Change to: “Our findings indicate that the measurements are reproducible and without significant technical error.”

Results and discussion

“In the age 14 years group, an outsider stature value of 183.9 cm”

Does this mean “In the age 14 years group, an outlying stature value of 183.9 cm”? If so, please amend.

“Foot length measurements (T1 to T5) did not show any side differences, hence, mean of right and left side was taken”

Change to: “Foot length measurements (T1 to T5) did not show any differences between left and right feet, hence the mean of right and left feet together was used”

“However, for stature estimation from the foot breadth measurements (BBAL, BHEL), linear regression models are derived for right and left side individually”

Change to: “However, for stature estimation from the foot breadth measurements (BBAL, BHEL), linear regression models are derived for right and left feet individually”

“…regression models may be applied in stature estimation from foot and its various segments”

Change to: “…regression models may be applied in stature estimation from the foot and its various segments”

“Although the standard error of estimate (SEE) value is minimum and…”
SEE as an acronym has been used earlier. Please use the full explanatory (standard error of estimate) earlier on first usage of SEE alone.

“…can not be applied on the sub-adults”

Change to: “…can not be applied to the sub-adults”

“Keeping in view of the lack of systemic studies on stature”

Change to: “Keeping in view the lack of systemic studies on stature”

Conclusions

“Researchers are encouraged to conduct similar studies in different population groups so that the standards can be generated which can further be used in the identification of individuals from human remains.”

Change to: “Researchers are encouraged to conduct similar studies in different population groups to look into the generation of further standards which can further be used in the identification of individuals from human remains.”

The conclusions should make it even more explicit that the findings as they stand apply to the very specific population studied (the sub-adult female population of North India)

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

'I declare that I have no competing interests'