Accuracy Of Balwant Rai Equations In Age Determinant From Osteons An Age

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Citation

Abstract

A histological study was conducted on 82 subjects of both sexes (Male 41 Female 41) from the compact portion of mandible to determine age by Balwant Rai Equation. In majority of the cases it was observed that the low (2-6 years) as compared to actual age.

INTRODUCTION

Identification and determination of unknown human skeletal remains has been one of the most challenging tasks for forensic medico-legal. Age is an extremely vital parameter in personal identity of living subjects as well as skeletonised dead bodies. Determination of age from skeletal remains has been studied and analysed by many workers. [1,2,3,4,5,6] The determination of age at time of death from histology of compact bone was has been studied by researchers. It is not only possible to differentiate between human and non-human bone fragments. (Schranz, 1954) but also the age of the individual bone. [7] The most effective study of several other studies on bone histology and age related charges was carried out by Kerely (1965 and 1969), [8,9,10,11] who developed a method of age determination based on microscopic analysis of the cortex of the long bones.

Singh and Gung (1970) studied bone section for various parameters including osteons. [8] It was observed that the number of osteons increased with age. Present study was done for determination of age of the individual at death of both sexes from the compact portion of mandible on histological observation by Balwant Rai.

MATERIAL AND METHOD

This study was done on the compact portion of mandible, collected from 41 males and 41 females of know age, brought for postmortem examination at Post Graduate Institute of Medical Sciences, Rohtak. Bone samples from adult persons devoid of any bone anomalies were studied.

In the present study slides from bone samples were prepared by under calcified method. Initially the bone samples were boiled in soap solution (Nirma Soap) for five hours to remove organic material. After washing, they were suspended over cholorform for 50 hours to remove fats. Each section was cut with Jeweller's saw into several sections. These sections were hand grinded untill they become transparent. Transparent sections were fixed on slides with the help of D.P.X. monutant.

In each section the number of osteons, consisting of complete haverian system were counted in four fields, taking the average osteons that were obliquely cut were included only if the complete haverian canal was seen.

OBSERVATIONS

Following Balwant Rai equation was applied after for age determination.

Figure 1

Table 1: mean± sd of actual age and estimated age in various group.

$$Age = No.\ of\ osteons + 8.3$$

Groups	Chronological age	Estimated age
Group I	23.7 ± 2.4	21.3 ± 6.2
Group II	35.6 ± 5.3	29.3 ± 6.4
Group III	43.9 ± 6.3	39.8 ± 6.2
Group IV	54.7 ± 7.3	49.4 ± 5.7

Age determination by Balwant Rai equation is less as compared to actual (2-6 years).

DISCUSSION

Traditional method of estimation of age depends upon gross morphologic criteria which has been useful, but age limited

in application. [5] Quantitative histology on the other hand permits objectivity and resulting data are amendable to statistical analysis. The value of histological method are further significant because of their limited demand of amount of material resulted for estimation.

In present study that number of osteons and average number of lamellae per osteon increased with age but heversian canal diameter decreased with age and studied by Singh and Gunberg (1970). [8] In present study notical, variable and diameter of secondary osteons as by William et al (1995) [9] in adult compact bone.

Dr. S.Lal et al (2004)5 had noticed different size and shape of secondary osteons at 18 to 55 years of age, where as after 55 years of age the secondary osteons appeared more or less uniform while in present study size and shape of secondary osteon is variable and not uniform at age groups. Also there was a gradual increase in number of osteons with age. It was 12 osteons per field at about 20 years, 15 obsteons at 23 years, 30 osteons at 35 years and 50 osteons at 58 years of age. While in tibia (S.Lal et al, 2004) osteons was approximately 15 osteons per field at about 15 years, 35 osteons at 40 years and 47 osteons at 65 years of age.

The derive equation arrived at shows the difference approximately of 2 to 6 years between the actual and estimated age.

CONCLUSION

It has been reported that estimation of age by Balwant Rai equation although it may be useful in age determination as a assisting tool for forensic.

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