**Original Article**

# CORRELATION BETWEEN HIEGHT AND AXIAL LENGTH OF THE EYE BALL OF HEALTHY ADULT EMMETROPES

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**Abstract-**
This study aims at finding out whether there is any correlation between the height of the individual and the axial length in the absence of any refractive error. This research is very relevant especially in the scenario where refractive surgeries are very common . This is an anthropometric data which will give insight into prediction of axial length for paediatric age group.

**Introduction**
Axial length is the distance between the centre of the cornea and the posterior pole of the eye
This is the first ever study which is establishing a correlation between the height of the individual and the axial length in an emmetrope.
Till date an increased axial length has always been attributed to myopia but anthropometric effect on the axial length of the eye has never been studied

**Aim of the study-**
1.Study of the correlation between two important anthropometric data height of the individual and axial length.
2. Make suggestions and polices for intake into various jobs in combat role.

**Material and methods**
This is a retrospective observational study and adhdered to the tenets of Declaration of Helsinki. Institutional review board approval was obtained prior to the study.
Height of the individual measured in centimetres, measured by a single observer were included.
Axial length is defined as the distance between anterior corneal surface and the posterior pole when measured in mm using ultrasound biometry

Retrospective analysis of 100 male adults of age group (21-25 yrs) evaluated for joining security forces were analysed with respect to their height and axial length of the eye ball.

All candidates who were found medically fit in all aspects attending the centre between period of 2018-2018 were included

In this study , the candidates who had qualified and had emetropia were chosen and their lengths and respective axial length compared .

Inclusion criteria

Age group-20-25yrs, males

No other medical ailment

Exclusion criteria-

Subjects with any refractive error

Any other ocular or systemic pathology

**Results-**

Between December 2018 to 2019, the record of all candidates who underwent medical examination were included

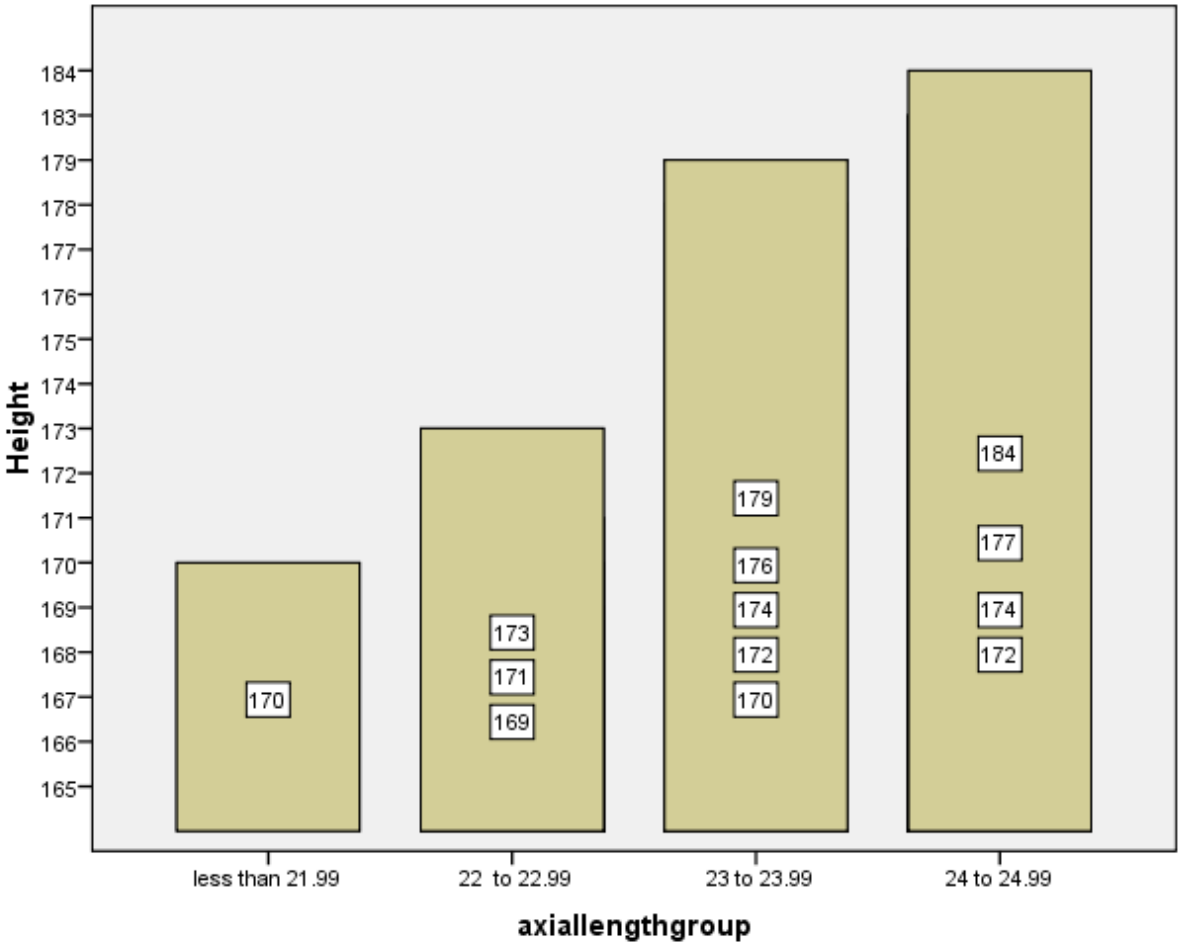
Height ranged from 165 to183 cm

Axial length ranged from 22.03 to 24.74 mm

All findings were plotted on a scale as dot graph- scatter diagram

It showed a linear relationship between the height and the axial length. The positive correlation is clinically significant.

A 2 tailed paired t test was performed and the correlation was found to be significant.




**Correlations**

| | | Height | Axiallength |
|---|---|---|---|
| Height | Pearson Correlation | 1 | .631** |
| | Sig. (2-tailed) | | .000 |
| | N | 70 | 70 |
| Axiallength | Pearson Correlation | .631** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 70 | 70 |

**. Correlation is significant at the 0.01 level (2-tailed).

**Discussion**

The axial length is the distance between the anterior corneal surface and the pigment epithelial layer of retina. A scan ultrasound biometry and optical biometry are two basic type of instruments used for measuring axial length of the eye. A scan or applanation ultrasound uses high frequencies (10 mega hertz) sound waves to measure axial length.

Optical biometry is based on optical partial coherence interferometry (PCI). This method is more accurate and observation error and bias is minimized and has a repeatability of ± 0.04 mm.

Usually the axial length of the eye ranges between 22 to 24 mm

The height of human beings is dependent on ethnicity, genetics, environmental factors like nutrition and exercise, general health of the individual and gender. The growth in height increases at variable pace with growth spurts in infancy and early childhood and around adolescence. The male gender in a given population attains more height than females. The tallest and shortest is decided by ethnicity.

However what is noteworthy that most humans attain a maximum height by 19 to 20 yrs of age, though there may be exceptions. In axial myopia the axial length of the eye ball is more and hence the focal point of the eye is in front of the retina. In progressive myopia the axial length continues to grow even beyond 20 yrs. This fact is important in planning refractive surgery.

This is the first study to establish a correlation between the two anthropometric measurements in emmetropic males

Since in our study we have found a positive linear correlation between the two parameters, there is a possibility in future to create a bionic eye which is more accurate. **Finanacial support and sponsorship**

Nil

**Conflict of interest**

Nil

**Conclusion-**

From this study we coclude that there is a positive correlation between the height and the axial length of the eye ball

This will help us in future research in planning IOLs and implant devices

Prediction of IOL power in paediatric cataract and also about planning future research

**References**

1. . Morgan IG, French AN, Ashby RS, Guo X, Ding X, He M, et al.. The epidemics of myopia: Aetiology and prevention. *Prog Retin Eye Res.* (2018) 62:134–49. 10.1016/j.preteyeres.2017.09.004

2. Hyman L, Gwiazda J, Hussein M, Norton TT, Wang Y, Marsh-Tootle W, et al.. Relationship of age, sex, and ethnicity with myopia progression and axial elongation in the correction of myopia evaluation trial. *Arch Ophthalmol.* (2005) 123:977–87. 10.1001/archopht.123.7.977

3. Kearney S, Strang NC, Cagnolati B, Gray LS. Change in body height, axial length and refractive status over a four-year period in caucasian children and young adults. *J Optom.* (2020) 13:128–36. 10.1016/j.optom.2019.12.008 4.Correlation Between Increase of Axial Length and Height Growth in Chinese School-Age Children

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5.Tanner JM, Whitehouse RH. Clinical longitudinal standards for height, weight, height velocity, weight velocity, and stages of puberty. *Arch Dis Child.* (1976) 51:170–9. 10.1136/adc.51.3.170

6. Ip JM, Huynh SC, Kifley A, Rose KA, Morgan IG, Varma R, et al.. Variation of the contribution from axial length and other oculometric parameters to refraction by age and ethnicity. *Invest Ophthalmol Vis Sci.* (2007) 48:4846–53. 10.1167/iovs.07-0101