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Research Article

CORRELATION STUDY OF BODY MASS INDEX WITH INTRA OCULAR PRESSURE IN MALWA REGION OF MADHYA PRADESH, INDIA

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ABSTRACT

Objective: The aim of the study was to examine the connection among BMI and chose visual boundaries like IOP.

Methods: Three hundred stout subjects and 200 age- and sex-matched sound subjects were signed up for this planned cross-sectional review. Ophthalmological assessments including intraocular pressure (IOP) and refractive mistake were performed regarding each matter. Visual assessment included estimation of refractive mistake for far off vision with Snellen's outlines or ignorant E diagram at 6 m in a sufficiently bright room Height and weight of all subjects were recorded and weight list (BMI) was determined.

Results: It was observed that the IOP of the overweight gathering was fundamentally higher (13.56±3.12 mm Hg) than that of the typical weight bunch (11.86±2.12 mm Hg) $p<0.01$.

Conclusion: It was observed that BMI firmly corresponded with expanded IOP. Likewise, the level of corpulence was viewed as a critical variable; in this way, the connection between these visual boundaries and the seriousness of stoutness ought to be additionally explored.

Keywords: BMI, Intraocular pressure, Keratometry, Refractive error.

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INTRODUCTION

Inordinate aggregation of fat tissue (heftiness) can debilitate physical, psychosocial, and general health [1]. Heftiness distresses all age gatherings, from youth to advanced age; however, there has been an especially fast expansion in predominance among youth and youthful adults [1,2]. Weight file (BMI), determined as weight (kg)/tallness $(m)^2$, is the most broadly taken on measurement for characterizing underweight, overweight, and heftiness. The World Health Organization characterizes underweight as a BMI≤18.50, typical load as a BMI in the reach 18.50–24.99, overweight as 25.00–29.99, corpulent Class I as 30.00–34.99, hefty Class II as 35–39.99, and fat Class III as BMI≥40. Dreary stoutness is characterized as BMI≥35 kg/m^2 alongside going with sicknesses or ≥40 kg/m^2 without weight-related illness [3].

Corpulence has different notable impacts on the cardiovascular and metabolic frameworks. Anyway the effect of corpulence on the eye has not been very much archived. Some eye infections, for example, glaucoma, waterfall, age-related macular degeneration, and diabetic retinopathy might be related with weight [4]; however, an unmistakable pathophysiological clarification for the relationship of stoutness with eye illnesses is presently deficient. A few mechanical and vascular elements or oxidative pressure might add to the pathogenesis of eye infections in fat individuals.

The evaluation of several anterior segment parameters such as anterior chamber depth (ACD) and central corneal thickness (CCT) is of paramount importance for ophthalmic examinations. These parameters may provide valuable information for the risk assessment of glaucoma, refractive power of eye, and intraocular pressure in relation to BMI.

METHODS

A hospital-based cross-sectional study will be conducted at Department of Ophthalmology, Government Medical College, Ratlam, Madhya Pradesh (MP), India, on 500 subjects of age group 18 years and above coming to OPD of district hospital, Ratlam (MP), India.

Written informed consent will be obtained from each patient in their local language.

All subjects underwent a physical examination including medical history, arterial blood pressure, height, weight, waist and hip circumference measurement, and waist-hip (W/H) ratio calculation. The BMI was calculated as weight in kilograms divided by the height in meters squared (kg/m^2).

All subjects will undergo a comprehensive ophthalmic examination including medical history review, best-corrected visual acuity, slit-lamp biomicroscopy, tonometry, retinoscopy, biometry, and topographic evaluation. IOP will be measured with applanation tonometer.

Ocular examination for distant vision with Snellen's charts or illiterate E chart at 6 m in a well-lit room. Refraction will be done on all subjects who presented with a visual acuity worse than 6/6 in either eye. Objective refraction will be performed with a streak retinoscopy and further refined with subjective refraction. Near vision will be assessed in all subjects using a Snellen's near vision chart or illiterate E near chart at working distance of 33 cm after correcting their distance vision. Each person who could not read N8 vision after best distance correction will be checked for improvement by adding appropriate increments.

Inclusion criteria

Age >18 years who visited ophthalmology OPD of our institute were included in the study.

Exclusion criteria

Smoking habits, history of any ocular disease or previous surgery, and presence of systemic diseases such as diabetes mellitus, hypertension, renal or hepatic dysfunction, and rheumatological diseases are excluded from the study.

Table 1: Demographic data of participants

Parameters	Total (n=500)	Normal weight (n=300)	Overweight (n=200)	p-value
Age (years)	47.0±14.0	44.0±10.0	46.00±9.50	0.560
Sex				
Male	300 (60%)	150 (50%)	150 (50%)	
Female	200 (40%)	100 (50%)	100 (50%)	
Systolic BP	128.69±10.19	120.58±15.71	136.78±17.09	<0.01
Diastolic BP	80.32±11.79	74.45±8.56	86.20±12.10	<0.01
BMI	24.78±6.24	21.89±1.15	27.67±5.36	<0.01
W/H ratio	0.85±0.09	0.83±0.09	0.88±0.03	<0.01

Table 2: Comparison of anterior segment parameters(IOP) of eyes between groups

Parameters	Total (n=500)	Normal weight (n=300)	Overweight (n=200)	p-value
IOP (mmHg)	12.70±2.12	11.86±2.12	13.56±3.12	<0.001

IOP: intraocular pressure. p<0.001: Significant

RESULTS

The demographic characteristics of subjects are shown in Table 1.

The systolic blood pressure (SBP) and diastolic blood pressure (DBP) of the overweight group were significantly higher than those of the normal weight groups (Graph 1).

Regarding the anterior segment (AC) parameters, it was found that the IOP of the overweight group was significantly higher than that of the normal weight group (13.56±3.12) and 11.86±2.12 mm Hg, respectively, p<0.01) (Table 2).

DISCUSSION

The WHO characterizes weight as BMI of 30 kg/m^2 or more prominent and sullen heftiness as BMI of 40 kg/m^2 or more noteworthy. Due to the potential general well-being effect of stoutness, there is an extraordinary need to recognize its belongings, especially on visual boundaries, and survey the instruments used to quantify these impacts [5].

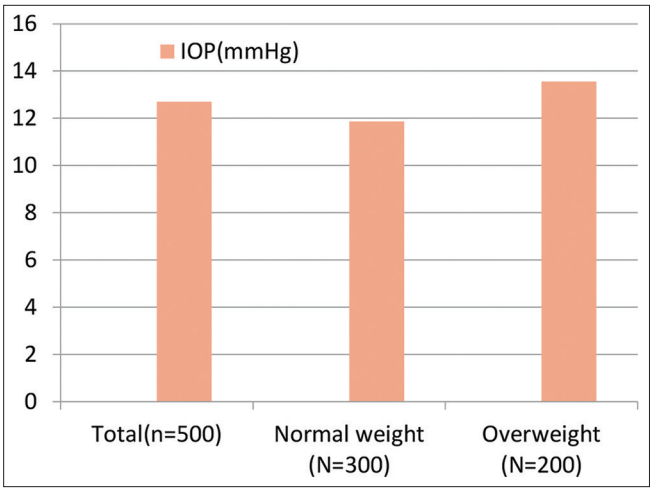
In this review, we thought about the upsides of front portion boundaries acquired utilizing Scheimpflug-Placido geologist, OLCR, and non-contact SM in fat patients. Both tallness and weight are reliant on complex hereditary and natural impacts all through early stages, adolescence, and adulthood.

In a new investigation of ethnically Chinese grown-ups in Singapore, Wong *et al*. [6] tracked down a positive connection among stature and AL, ACD, focal point thickness, and corneal evenness. Conversely, they tracked down no critical connections between these boundaries and weight or BMI.

In an investigation of Singapore Chinese youngsters, Saw *et al*. [7] moreover tracked down no connection among BMI and visual boundaries, and more hefty kids had eyes with refractions that were more hyperopic.

Hazard factors for high IOP have been broadly concentrated because of the solid relationship with glaucomatous optic nerve damage [8,9]. In the Beaver Dam Eye Study, IOP was decidedly associated with BMI among different variables. Moreover, epidemiologic examinations have revealed that the increment in IOP related with corpulence is autonomous old enough, systolic pulse, and diastolic circulatory strain (DBP) [10,11].

Stojanov and partners detailed that corpulent people have fundamentally higher IOP than that of non-fat individuals [12], and Gunes *et al*. found raised IOP in Turkish patients with BMI ≥39 [13]. Moreover, both Gunes *et al*. and Jang *et al*. tracked down a positive relationship among's IOP and BMI [14,15]. In our review,



Graph 1: Graphical presentation of IOP between two groups

this relationship was viewed as feeble. As opposed to IOP, just few investigations have examined the relationship among BMI and glaucomatous optic neuropathy. One investigation discovered that high BMI improves the probability of clinical glaucoma analysis at medical clinic affirmation. Nonetheless, a case–control concentrates on tracked down no measurably critical contrast in BMI among glaucomatous and non-glaucomatous subjects [16]. Further examinations are expected to decide relationship among BMI and glaucoma.

Limitation of study

The major limitation of this study is that we measured visual acuity using Snellen charts as a part of routine clinical practice rather than in a standardized research setting or using more sophisticated study charts that would have pointed out other visual pathologies

CONCLUSION

It was found that BMI strongly correlated with increased IOP. Furthermore, the degree of obesity was found to be a significant factor; therefore, the relationship between these ocular parameters and the severity of obesity should be further investigated.

AUTHOR CONTRIBUTIONS

All authors have equally contributed equally.

CONFLICT OF INTEREST STATEMENT

Nil.

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