COMPARISON OF EYELID ANGLE MEASURED USING MANUAL AND DIGITAL IMAGE ANALYSIS METHOD

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INTRODUCTION

The eyelids protect the eye from excessive light or injury and also assists in the distribution of tears over the ocular surface. The amount of ocular surface exposure at different distances can be related with the eyelid angle. The area of ocular surface which is exposed decides the amount of eye fatigue and the eye irritation experience by an individual.¹

Pre and postoperative eyelid assessments are very important in cosmetic eye surgeries particularly in case of ptosis. Accurate measurements are essential for surgical planning and postoperative evaluation.²

AIM: To compare the eyelid angle measured by using a manual method (protractor) and digital image analysis method (ImageJ software) at different distances of eye gaze.

METHODOLOGY

RESULTS

- Mean age of the participants was 20 ± 0.5 years.
- Anthropometry measurements of the eyelid and Palpebral fissure were done using meter scale and PD ruler as shown below.

Degree (Median $\pm$ IQR)		Distance	Intermediate	Near
Manual protractor method	OD	56 $\pm$ 8	50 $\pm$ 7	41 $\pm$ 7
	OS	58 $\pm$ 10	51 $\pm$ 9	43 $\pm$ 7
Digital image analysis method	OD	55 $\pm$ 6	51 $\pm$ 8	44 $\pm$ 9
	OS	56 $\pm$ 7	53 $\pm$ 7	46 $\pm$ 7
Eyelid angle measurements using manual protractor method and digital image analysis method				

- OD - No statistically significant difference ($p > 0.05$) between two methods at distance but there was statistically significant difference ($p < 0.05$) at Intermediate and near.
- OS - Statistically significant difference ($p < 0.05$) between the two methods at all three distances.
- IPD: 60.95 $\pm$ 2.37mm, Endo ICD: 32.20 $\pm$ 2.39mm, Exo ICD: 95.50 $\pm$ 3.80mm, PFH_OD: 12.11 $\pm$ 1.32mm, PFH_OS: 12.16 $\pm$ 1.46mm, PFW_OD: 32.00 $\pm$ 1.10mm, PFW_OS: 32.11 $\pm$ 1.24mm, Height of upper eyelid_OD: 10.26 $\pm$ 1.66mm OS: 10.42 $\pm$ 1.83mm.

DISCUSSION

- Normative oculopalpebral anthropometric parameters - indispensable in accurate clinical interpretation of palpebral disease. Serve as reference points during cosmetic and reconstructive surgical interventions in the eyelid³
- Kikuchi et al values on mean angle of the eyelashes in males and females were $61.4^\circ \pm 13.7^\circ$ and $71.8^\circ \pm 13.5^\circ$ respectively for the upper eyelid which was comparatively higher than that which was determined in this study.
- Another study by Surendra et al, measured the anthropometric measurements which were comparatively higher again than the current study.

CONCLUSION

- There was a significant difference in eyelid angle measured using manual protractor method and digital image analysis method.
- Hence more studies on the validation of the anthropometry measurements and eyelid angle using digital image analysis are essential to use digital image analysis in routine eye care practice.

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