# Ocular biometric parameters in patients undergoing cataract surgery and their correlations with clinical and demographic data

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- ***PURPOSE***

  To report data from optical biometry in a cohort of Greek patients undergoing cataract surgery and investigate possible correlations with demographic and clinical parameters.

- ***METHODS***

  In this cross-sectional study, 314 adult patients that underwent ocular biometry were included.

  ***Exclusion criteria included:***

  corneal, retinal abnormalities & history of trauma

***Biometric data included:***

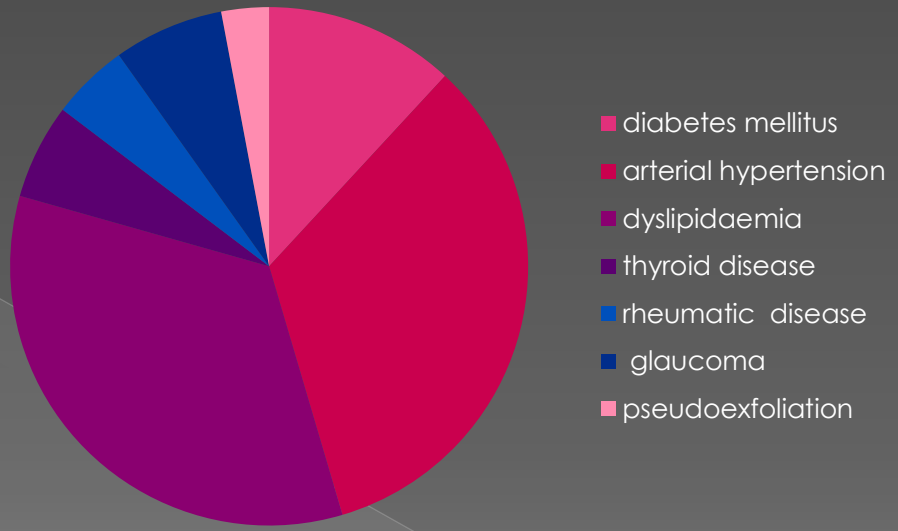
spherocylindrical error
axial length(AXL)
keratometry(Kf,Ks),
anterior chamber depth(ACD),
lens thickness(LT)
& white-to-white distance(WTW)

***Clinical parameters included:***

the presence of glaucoma
pseudoexfoliation
arterial hypertension
diabetes thyroid or rheumatic disease
& dyslipidaemia

*The **frequencies** of the various conditions are shown below*:

- diabetes mellitus 20.4%
- arterial hypertension 57.6%
- dyslipidaemia 58.3%
- thyroid disease 10.2%
- rheumatic disease 8.3%
- glaucoma 11.8%
- pseudoexfoliation 5.1%




- 8% of eyes were pseudophakic

## *The mean values and standard deviations of various data are shown below*

| | Mean | Std. Deviation |
|---|---|---|
| Age | 73,41 | 7,91 |
| Sphere | -0,2201 | 2,59 |
| Cylinder | -1,2873 | 0,86 |
| Degree | 93,48 | 38,20 |
| Kflat | 43,078796178344000 | 1,63 |
| Degree Kf | 90,28 | 50,16 |
| Ksteep | 43,806656050955400 | 3,21 |
| Degree Ks | 91,43 | 59,960 |
| ACD | 3,201719745222930 | 0,56 |
| AXL | 23,7090 | 1,16 |
| LT | 4,345732484076440 | 1,15 |
| WTW | 11,906942675159200 | 0,48 |

# STATISTICAL ANALYSIS

Data *were not normally distributed (**Kolmogorov Smirnov** test)*, and we therefore used non-parametric tests.

***Spearman's test*** showed statistically significant strong correlations between *AXL- ACD* (r= 0.587, p=0.01) and between *ACD-LT* (r= -0.507, p=0.01).

**Age was correlated with:**

- *sphere* (r=0.319 p=0.01)
- *cylinder* ( r=0.299 p=0.01)
- *AXL* (r=-0.196 p=0.01)
- *ACD* (r=-0.267 p=0.01)
- *LT* (r=-0.275 p=0.01)
- *WTW* distance (r=-0.247 p=0.01)

***Mann-Whitney U test*** demonstrated statistically significant differences:

- in *AXL* and *ACD* between males and females,
- in *ACD* in patients with or without diabetes mellitus
- in *ACD* in patients with or without glaucoma
- and in *LT* in patients with or without arterial hypertension.

## AXL across gender

| Independent-Samples Mann-Whitney U Test Summary | |
|---|---|
| Total N | 289 |
| Mann-Whitney U | 12643,500 |
| Wilcoxon W | 19084,500 |
| Test Statistic | 12643,500 |
| Standard Error | 693,258 |
| Standardized Test Statistic | 3,894 |
| Asymptotic Sig.(2-sided test) | **<,001** |

## ACD across gender

| Independent-Samples Mann-Whitney U Test Summary | |
|---|---|
| Total N | 289 |
| Mann-Whitney U | 12462,500 |
| Wilcoxon W | 18903,500 |
| Test Statistic | 12462,500 |
| Standard Error | 693,223 |
| Standardized Test Statistic | 3,633 |
| Asymptotic Sig.(2-sided test) | **<,001** |

## ACD across diabetes

| Independent-Samples Mann-Whitney U Test Summary | |
|---|---|
| Total N | 289 |
| Mann-Whitney U | 8094,500 |
| Wilcoxon W | 9864,500 |
| Test Statistic | 8094,500 |
| Standard Error | 572,621 |
| Standardized Test Statistic | 2,287 |
| Asymptotic Sig.(2-sided test) | **,022** |

## LT across art.pressure

| Independent-Samples Mann-Whitney U Test Summary | |
|---|---|
| Total N | 289 |
| Mann-Whitney U | 11901,000 |
| Wilcoxon W | 25929,000 |
| Test Statistic | 11901,000 |
| Standard Error | 701,648 |
| Standardized Test Statistic | 2,443 |
| Asymptotic Sig.(2-sided test) | **,015** |

## ACD across glaucoma

| Independent-Samples Mann-Whitney U Test Summary | |
|---|---|
| Total N | 289 |
| Mann-Whitney U | 3399,500 |
| Wilcoxon W | 4029,500 |
| Test Statistic | 3399,500 |
| Standard Error | 463,477 |
| Standardized Test Statistic | -2,256 |
| Asymptotic Sig.(2-sided test) | **,024** |

# CONCLUSION

- *Our results showed that AXL was positively correlated with ACD and LT was negatively correlated with ACD. In other words, longer eyes had deeper AC and eyes with thick lenses had shallower AC.*
- *Eyes with glaucoma had shallower AC compared to non-glaucomatous eyes.*
- *Interestingly, we found that diabetic patients had shallower AC, a finding that needs further research.*
- *Both age and gender were correlated with various parameters.*

*Our study is ongoing aiming to analyze a big cohort in order to report ocular biometric data in the Greek population and possible correlations between various conditions.*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