Comparison of the Diaton Transpalpebral Tonometer Versus TonoPen-Applination

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Purpose

- To compare intraocular pressure (IOP) measurements obtained with Diaton trans-palpebral tonometry versus Tonopen applanation tonometry in children and adults.

Introduction

- Goldmann applanation is the gold standard for IOP measurement
- It has been supplanted by TonoPen applanation in many settings because of it’s ease of use, portability, convenience, and minimal training requirements.
- The TonoPen requires contact with the corneal surface, and has the risks of iatrogenic corneal injury, spread of pathogens, and requires topical anesthetics.

Introduction

- The newly-developed Diaton tonometer is a handheld device that measures pressure through the tarsal plate (Figures 1 & 2).
- It avoids contact with the cornea and the need for topical anesthesia.

Figure 1: The Diaton Transpalpebral Tonometer

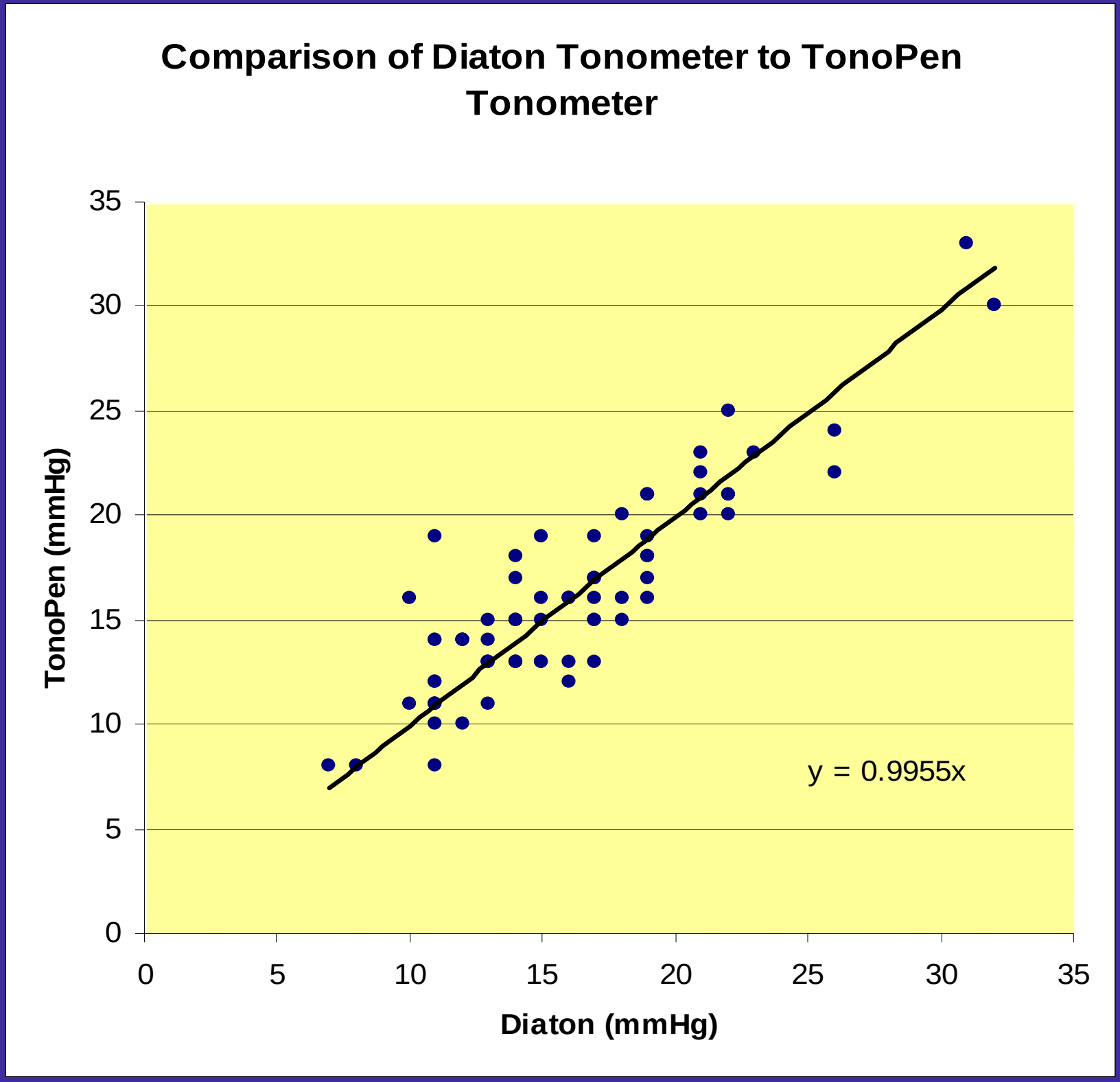
Figure 2: Using the Diaton Tonometer

Methods

- We looked at 74 eyes of 38 consecutive patients who received both Tonopen and Diaton tonometry
- TonoPen measurements were taken in the sitting position following topical anesthesia with proparicaine.
- Diaton measurements were performed in the sitting position with the patient gazing at a 45° angle, placing the eyelid margin at the superior limbus. If necessary, gentle traction was placed on the brow to align the lid with the limbus. The device was activated when the signaling mechanism indicated the device was vertical.

Results

- Age range 3-91 years of age (mean 47.5 years).
- The average IOP with the Diaton was 16.24 (+/-5.11 mm Hg; range = 7-32 mmHg).
- The average IOP with the TonoPen was 16.37 (+/-4.90 mm Hg; range = 8-33 mmHg).
- The mean variation between the two modalities was 1.59 mmHg (+/-1.31 mm Hg; range = 0-6 mmHg).
- Eighty-one percent of all measurements were within 2 mmHg of each other (Table 1).
- There was no statistically significant difference in mean IOP values obtained with the two devices (p=0.87).


Comparison of Diaton Tonometer to TonoPen Tonometer
TonoPen (mmHg)
Diaton (mmHg)
0
5
10
15
20
25
30
35
y = 0.9955x

Table

Device	Mean IOP (standard deviation)	IOP Range
Tonopen	16.37 (+/-4.90 mm Hg)	**8-33 mm Hg**
Diaton	16.24 (+/-5.11 mm Hg)	**7-32 mm Hg**
Variance between devices	1.59 (+/-1.31 mm Hg)	**0-6 mm Hg**

Conclusions

- The Diaton tonometer pressure measurements correlated well with TonoPen measurements in this retrospective review.
- We did not find problems performing the exam in children, and many were reassured by the fact that no drops were needed.
- There may be a notable benefit in patients after refractive surgery or with corneal pathology since the Diaton does not applanate the cornea.
- The Diaton tonometer appears to be a clinically useful device in the IOP measurement of both children and adults.

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