Use of disposable prism tonometry in routine clinical practice

SALVI S. M. [1] *; SIVAKUMAR S.* [2] *; SIDIKI S. S.* [1] *;*

(1) Department of Ophthalmology The Ayr Hospital, Ayr, ROYAUME-UNI
(2) Department of Ophthalmology Birmingham Heartlands & Solihull Hospital, Birmingham, ROYAUME-UNI

Abstract

Aim To establish the reliability, efficacy, and safety of disposable prism tonometry and validate its routine use for screening as well as monitoring of glaucoma.

Methodology Intraocular pressure (IOP) of 400 eyes of 200 consecutive patients who attended the general ophthalmic clinic was checked with both the Goldmann applanation tonometer and a disposable tonometer prism by an experienced examiner after obtaining informed consent. The data were statistically analysed.

Results The mean difference in the IOP between the two types of prisms was 0.1mmHg (SD±1mmHg).

Conclusion Disposable prism tonometry provides a reliable, effective, and safe alternative to Goldmann reusable prism tonometry for routine screening as well as monitoring of glaucoma with the advantages of eliminating the need for chemical disinfection and therefore eliminating the risk of crossinfection.

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Comparison between standard Goldmann applanation prism and disposable applanation prism in tonometry

GOEL S.[(1)] ; CHUA C.[(1)] ; DONG B.[(1)] ; BUTCHER M.[(1)] ; AHFAT F.[(1)] ; HINDI S. K.[(1)] ; KOTTA S.[(1)] ;

[(1)] Dewsbury District Hospital, Dewsbury, ROYAUME-UNI

Abstract

Background Disposable devices are increasingly becoming the preferred choice where possible in contact medical equipment.

Aim To evaluate the accuracy of the disposable applanation tonometer head as a potential substitute to the standard Goldmann applanation head.

Methods The study was prospective. The intraocular pressure recordings in 80 eyes of 42 patients were compared using the disposable and standard Goldmann applanator heads. The Bland and Altman method of assessing agreement between two methods of clinical measurement was used in the analysis.

Results The difference in the readings between the two types of tonometer heads was highly variable (mean difference = 0.78 mm Hg, range= -1 to 11 mm Hg). This was because of the distortions on the applanating surface of the disposable device. When the readings associated with the defective heads were excluded, very strong agreement was obtained (mean=0.07 mm Hg, range=-1 to 2 mm Hg).

Conclusion Good agreement with standard Goldmann applanation is achieved with the disposable heads except where surface distortions induce significant errors. Careful inspection to ensure well-structured disposable units is imperative in disposable applanation tonometry.

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A comparison of clinical performance between disposable and Goldmann tonometers

MAINO A. P.[(1)] ; UDDIN H. J.[(1)] ; TULLO A. B.[(1)] ;

[(1)] Royal Eye Hospital, Oxford Road, Manchester M13 9WH, ROYAUME-UNI

Abstract

Purpose Applanation tonometry as performed in routine clinical practice is a significant potential vehicle for cross-infection particularly in an emergency eye care setting. The aim of this study is to evaluate the accuracy and reliability of three single-use devices (Tonoshield, Tonosafe, Tonojet) as an alternative to standard Goldmann prisms in an emergency eye department.

Methods All patients attending the eye casualty at the Manchester Royal Eye Hospital for a period of 4 months who required intraocular pressure measurement were eligible for this prospective study. Exclusion criteria were: age below 18 years, corneal anomalies that might affect measurement, and refusal to participate. After taking informed consent, the patient was examined by one experienced nurse practitioner, who measured the intraocular pressure three times. In the first part of the study, we compared the standard Goldmann prism vs Tonoshield and Tonosafe prisms, while for the second part of the study we used standard Goldmann, Tonosafe, and Tonojet prisms. Agreement and repeatability tests were carried out on separate samples.

Results Tonosafe and Tonojet correlated well with standard Goldmann tonometry ($P < 0.001$), while the measurements obtained with Tonoshield were higher, especially for raised intraocular pressure measurements. Tonojet and Tonosafe measurements were more reproducible than Tonoshield measurements.

Conclusions This study shows that Tonosafe and Tonojet are accurate and reliable alternatives to standard Goldmann tonometry.

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Are disposable prisms an adequate alternative to standard goldmann tonometry prisms in glaucoma patients?

MAINO Anna P.[(1)] ; MORGAN Laurence H.[(2)] ; HERCULES Brian L.[(2)] ; TULLO Andrew B.[(1)] ;

(1) Royal Eye Hospital, Manchester, ROYAUME-UNI
(2) Eye Department, Stepping Hill Hospital, Stockport, ROYAUME-UNI

Abstract

Purpose: To evaluate the accuracy and reliability of 2 single-use tonometry devices (Tonosafe and Tonojet) as an alternative to standard Goldmann prisms in patients attending dedicated glaucoma clinics.

Design: Prospective experimental study with human subjects. Participants: Two hundred forty glaucoma patients who attended 2 glaucoma clinics at the Stepping Hill Hospital between January and February 2005.

Methods: During each examination, intraocular pressure (IOP) was measured 3 times, using the standard Goldmann prism, Tonosafe, and Tonojet, respectively. The prism sequence was predetermined at random using a computer, and the measurements were taken at 5-minute intervals. Data were analyzed using the Bland-Altman method of differences.

Main Outcome Measure: Intraocular pressure.

Results: Intraocular pressure ranged from 6 to 68 mmHg. Linear regression analysis indicated that there was a proportional bias between Goldmann and Tonosafe (r^2 = 0.368, P<.001), especially for values higher than 25 mmHg. On the other hand, there was no statistically significant proportional bias between Goldmann and Tonojet (r^2 = 0.006, P = 0.14).

Conclusions: Caution should be exercised when using Tonosafe prisms in the presence of IOP higher than 25 mmHg. On the other hand, Tonojet is an adequate and useful alternative to the Goldman tonometer for glaucoma patients.

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Tonometers and infectious risk : myth or reality? Efficacy of different disinfection regimens on tonometer tips

CILLINO S. [(1)] *; CASUCCIO A.* [(1)] *; GIAMMANCO G. M.* [(2)] *; MAMMINA C.* [(2)] *; MORREALE D.* [(1)] *; DI PACE F.* [(1)] *; LODATO G.* [(1)] *;*

(1) Dipartimento di Neurologia, Oftalmologia, Otorinolaringoiatria e Psichiatria, Sezione di Oftalmologia, Università degli Studi di Palermo, Palermo, ITALIE
(2) Dipartimento di Igiene e Microbiologia, Università degli Studi di Palermo, Palermo, ITALIE

Abstract

Purpose To evaluate the adequacy of common disinfection regimens for disposable tonometer tips and assess if disinfection of reusable prisms or the use of disposable tips is preferable.

Methods We used disposable tonometer tips, using the same material and tip diameter of standard Goldmann tonometer prism. Strains of Pseudomonas aeruginosa, Staphylococcus aureus, Bacillus subtilis and Candida albicans were tested according to the European standard guidelines for disinfectants test. Antimicrobial effectiveness of the following disinfection practices has been assessed: dry wipe, Minuten wipes (Alpro®), soaking in 3% hydrogen peroxide, 0.5% benzalkonium chloride, and 0.5% Pantasept® for 1, 5, and 15 min. All tests have been performed three times and all conditions tested in duplicate.

Results Dry wiping and 1 min soak in 3% hydrogen peroxide were ineffective on all microrganisms. Minuten wipes, 1 min soak in 0.5% benzalkonium chloride or 3% hydrogen peroxide were ineffective on B. subtilis. 0.5% Pantasept® soak was effective in 1 min for all microrganisms tested, whereas 3% hydrogen peroxide and 0.5% benzalkonium chloride soaks were effective when performed for at least 5 min. B. subtilis was the most resistant organism to disinfectant regimes at 1 min time.

Conclusions Results of our study demonstrate a relative disinfection efficacy for the different evaluated regimens, provided that correct exposure times are adopted for the chosen disinfectants, a condition difficult to ensure in a busy clinic setting. We conclude that disposable prism tonometry provides a safe alternative to Goldmann tonometry.

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