

SAFETY AND EFFICACY OF PNEUMATIC TRABECULOPLASTY IN AFRICAN POPULATION



Prigione G., MD, Hesse A., MD, Iester M., MD, Rolando M., MD, Calabria G., MD

Clinica Oculistica, DiNOG, University of Genoa, Azienda Ospedaliera Universitaria "San Martino", Genoa, Italy.

ABSTRACT

Purpose: In developing African countries the follow-up of patients is very difficult for cultural and logistic reasons. The aim of this study was to evaluate the utility of pneumatic trabeculoplasty (PNT) in the treatment of glaucomatous African patients.

Materials and Methods: This is a prospective study carried out in Ghana. Eighty two glaucomatous eyes were consecutively included in this study. All the eyes had been diagnosed primary open angle glaucoma based mainly on intraocular pressure by Goldmann tonometer, slit-lamp examination and optic disc evaluation by ophthalmoscopy. Each eye received two drops of oxybuprocaine clorhydrate and a negative pressure suction of 60 mmHg for one minute was applied by using scleral suction. The procedure was repeated after five minutes. IOP was assessed pre-treatment, after 30 minutes, the day-after, and after 1 week. Then a second treatment was performed in the same way, and the IOP was measured after 30 minutes and the day-after. A paired Student's t test was used to analyze the results. A p value < 0.05 was considered significant.

Results: The mean age of the included patients was 60.99 ± 14.17 years (mean ± standard deviation), and 67 (81.71%) were affected by cataract. The mean pre-PNT IOP was 25.71 ± 5.02 mmHg; no significant difference was found after 30 minutes, but after 1 day (P<0.001) and 1 week (P<0.005) the IOP reduction was significant. When the second PNT treatment was performed, a significant reduction was found after 1 day (P<0.001). No significant side-effects were found except for 16 cases (19.51%) of subconjunctival haemorrhages.

Discussion: In this study PNT showed a potentially good IOP lowering short term effect on glaucoma patients. Even if the mean decrease of IOP was 15.13%, this technique could be useful in developing countries where the compliance of medical therapy is low for logistic and cultural reasons. Moreover the lack of side-effects, except for transient conjunctival hyperemia and subconjunctival haemorrhages, makes PNT safe and easy to perform and could be carried out even by non ophthalmologist physicians.

PURPOSE

Aim of our study was to determine the efficacy and the safety of pneumatic trabeculoplasty (PNT) alone to lower IOP in African patients with primary open angle glaucoma (POAG).



MATERIALS AND METHODS

- 82 eyes of 42 patients (age > 18 years) with elevated IOP associated with a diagnosis of POAG;

Patients classified as having POAG when:

- Typically abnormal optic nerve head (ONH);
- Open angle at gonioscopy;
- Neither IOP nor HFA were used to classify patients.

Patients were classified as having abnormal OHH when:

- Optic rim notch;
- Diffuse/generalized loss of optic rim tissue;
- Vertical cup/disc diameter ratio asymmetry unexplained by side differences in optic disc size;
- Disc hemorrhage.

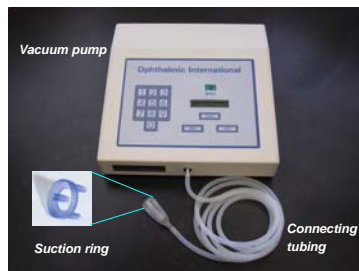
- IOP was evaluated with Goldmann applanation tonometry (Haag-Streit, Switzerland);

- Exclusion criteria: clinically significant corneal disorders; ongoing or previous history of intraocular inflammation; any intraocular surgery;

- PNT was performed on day 0 and 7

- IOP was evaluated on day 0 (before and 30 minutes after PNT), 1, 7 (before and 30 minutes after PNT), 8.

PNT PROCEDURE



The pump is preset to deliver a maximum vacuum pressure corresponding to 20 inches, inducing an IOP between 45-50 mmHg

- The patient was placed in the supine position.
- Oxybuprocaine clorhydrate was used to anesthetize the operative eye.
- The lids were gently spread by the physician using his fingers.

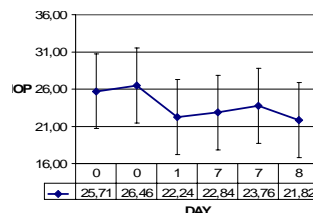


- The pneumatic suction ring was centered on the clear cornea and pressed down slightly until full suction was achieved.
- This pneumatic suction ring was left on the eye for 60 seconds.
- It was removed for 5 minutes.
- Repeated once again for 60 seconds



RESULTS

Mean post-treatment IOP



Descriptive analysis

Day	IOP Mean Value	SD	t-test of starting IOP vs post treatment IOP (p-value)
0 before PNT	25,71	5,02	
0 after PNT	26,46	5,00	0,335
1	22,24	5,54	<0,001
7 before PNT	22,84	5,51	0,001
7 after PNT	23,76	5,44	0,018
8	21,82	5,50	<0,001

RESULTS	N or %
Patients	42
Eyes	82
Mean age	60.99±/14.17 SD years
Mean pre-treatment IOP	25.71±/5.02 SD mmHg
Mean post-treatment IOP	21.82±/5.50 SD mmHg
Mean IOP drop	3.89 mmHg
Mean % IOP drop	-15.13 %

No clinically relevant changes were observed in visual acuity or gonioscopy

SIDE EFFECTS

- Conjunctival hyperemia
- Subconjunctival haemorrhages
- Mild discomfort
- Foreign body sensation

COMPLICATIONS

- No vascular occlusion
- No retinal detachment
- No macular edema
- No retina hole

72 eyes (87,80%) were responder to this therapy

DISCUSSION

PNT is a non-invasive method that has been reported to lower IOP in patients with POAG or OHT. The exact mechanism of the PNT lowering effect has not been elucidated but is believed to act by improving aqueous outflow by stretching the trabecular meshwork, and-or by widening the uveoscleral pathways.

In this prospective study performed on 42 POAG African patients, Pneumatic Trabeculoplasty has shown a significant (p<0,001) IOP lowering short term effect. In addition, we also considered in the statistical analysis the percentage of patients who reached an IOP reduction ≥ 15%, as suggested by European Guidelines of Glaucoma: "any type of treatment is considered to be effective if it achieves an IOP reduction of at least 15%". According to these criteria PNT treatment was efficacy on 60 eyes (73,17%).

We also found that 12,19% of the eyes were non-responders to this procedure but we could not understand the real reason. Adverse events were conjunctival hyperemia, subconjunctival haemorrhages, ocular discomfort and foreign body sensation, all of which were mild, required no treatment and resolved within a few days.

In conclusion this procedure could be useful in developing countries where the compliance of medical therapy is low for logistic and cultural reasons, even if it might not be suitable as monotherapy in all patients. Moreover the lack of side-effects, makes PNT safe and easy to perform and could be carried out even by non ophthalmologist physicians.