

The effect of piroxicam in preventing surgically induced miosis

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Summary

The effect of an antiprostaglandin, piroxicam, in preventing surgically induced miosis is studied. Patients undergoing extracapsular cataract surgery were randomly divided into the piroxicam and placebo groups. Intra-operative measurements of the pupillary diameters were performed. The stages of procedure at which they were measured were at the beginning of operation (Stage 1), after anterior capsulotomy (Stage 2), after lens nucleus delivery (Stage 3) and at the end of irrigation and aspiration (Stage 4). It is noted in this Study that the pupillary diameters were larger at stages 2,3 and 4 in the piroxicam group. The increase in the mean pupillary areas of the piroxicam group were statistically significant for Stages 3 and 4.

Key Words : Antiprostaglandin, surgical miosis

Introduction

Cataract is a major cause of visual disability. Senile cataract is the commonest variety of cataract. Presently the favoured technique of cataract extraction is by the extracapsular technique. This technique allows the implantation of a posterior chamber intraocular lens which has distinct advantages over other types of intraocular lenses. The operative technique involves anterior capsulotomy of the lens followed by expression of the nucleus and cortical clean-up. A well dilated pupil is of utmost importance in the procedure. In spite of vigorous preoperative dilatation with both anticholinergic and sympathomimetic agents, the pupil constricts during the procedure. The removal of lens material and the implantation of an intraocular lens in the capsular bag are hampered by this pupillary constriction. There may also be resultant posterior capsule tear and vitreous loss. There is strong evidence that prostaglandins are partially responsible for this surgically induced miosis.^{1,2,3,4}

Materials and methods

A total of 39 patients who underwent extracapsular lens extraction because of senile cataract were studied. They were randomly assigned to the piroxicam or the control group. Of the 39 patients, 21 were males and 18 were females. Their ages ranged from 42 to 82 years with a mean of 63.81 years. The dosage for the piroxicam group was 20 mg daily for 2 days pre-operatively. The placebo group was given a multivitamin capsule daily for 2 days pre-operatively. Pre-operative mydriasis were achieved by instillation of Gutt tropicamide 1% with phenylephrine 2.5% 1-2 hours before the operative procedure. The pupillary measurements were performed intraoperatively. The diameter of the pupil was measured under the operation microscope with a micrometer disk attached to the eye piece. The operation microscope was a Carl Zeiss OMPI 6 model. The micrometer disk could measure

to an accuracy of 0.05mm.

Recordings were made at four stages during the operative procedure. They were :-

- Stage 1 - at the beginning of the operation
- Stage 2 - after anterior capsulotomy
- Stage 3 - after expression of lens nucleus and
- Stage 4 - at the end of irrigation and aspiration

Results

The mean pupillary diameters of the piroxicam treated and placebo treated group at Stages 1 to 4 are summarised in Table 1. It can be seen that the mean pupillary diameters of the piroxicam group were larger at all 4 stages of the operative procedure. These were, however, not statistically significant ($P > 0.05$). The mean pupillary constriction or miosis between the two groups at different stages of the operation is illustrated in Fig. 1. It is noted that the degree of miosis were greater in the placebo group at stages 2,3 and 4. These were however not statistically different ($P > 0.05$). The pupillary areas at different stages of the procedure for both groups were also determined. These values are illustrated in Fig. 2. It was noted that the mean pupillary areas were larger in the piroxicam treated group at the end of anterior capsulotomy (Stage 2), end of lens nucleus delivery (Stage 3) and after irrigation and aspiration (Stage 4). These difference were statistically significant at stage 3 ($P = 0.02$) and stage 4 ($P = 0.037$).

Discussion

Table 1
Mean Pupillary Diameter at 4 Stages of Operative Procedure in Piroxicam and Placebo Treated Groups

MEAN PUPILLARY DIAMETERS

Stages	Mean Pupillary Diameters (mm)	
	Piroxicam	Placebo
1	6.89	6.77
2	6.30	6.11
3	5.80	5.30
4	5.68	5.17

In this study, the placebo group experienced a larger mean decrease in pupil diameter compared with the treatment group (Piroxicam). The maximum amount of miosis noted was at the end of irrigation and aspiration. It has been noted that the difference in pupillary diameters and degree of miosis between the two groups of patients is relatively small. However a relatively small difference in pupillary diameter can make an important difference in the pupillary area. A large pupillary area will result in the 'working space' of the surgeon being greater as well. Precautions were undertaken in this study to minimise errors. The patients in both groups were relatively well matched in numbers, age

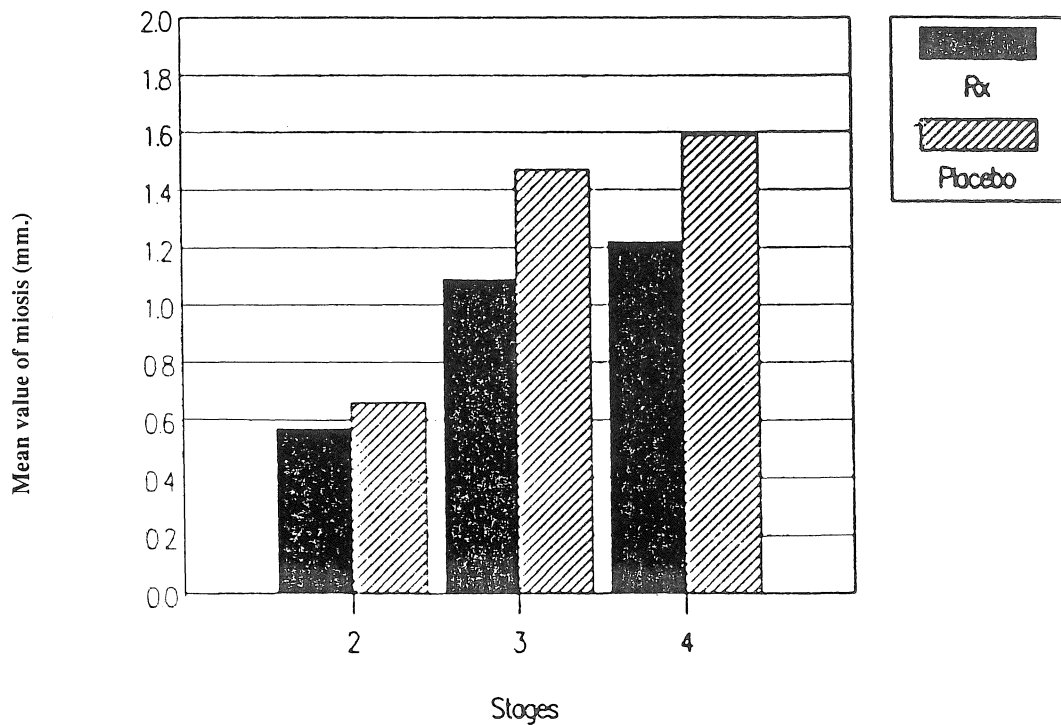


Fig. 1 : Comparison of the Mean Value of Miosis of Piroxicam Treated Group (Rx) and Placebo Group

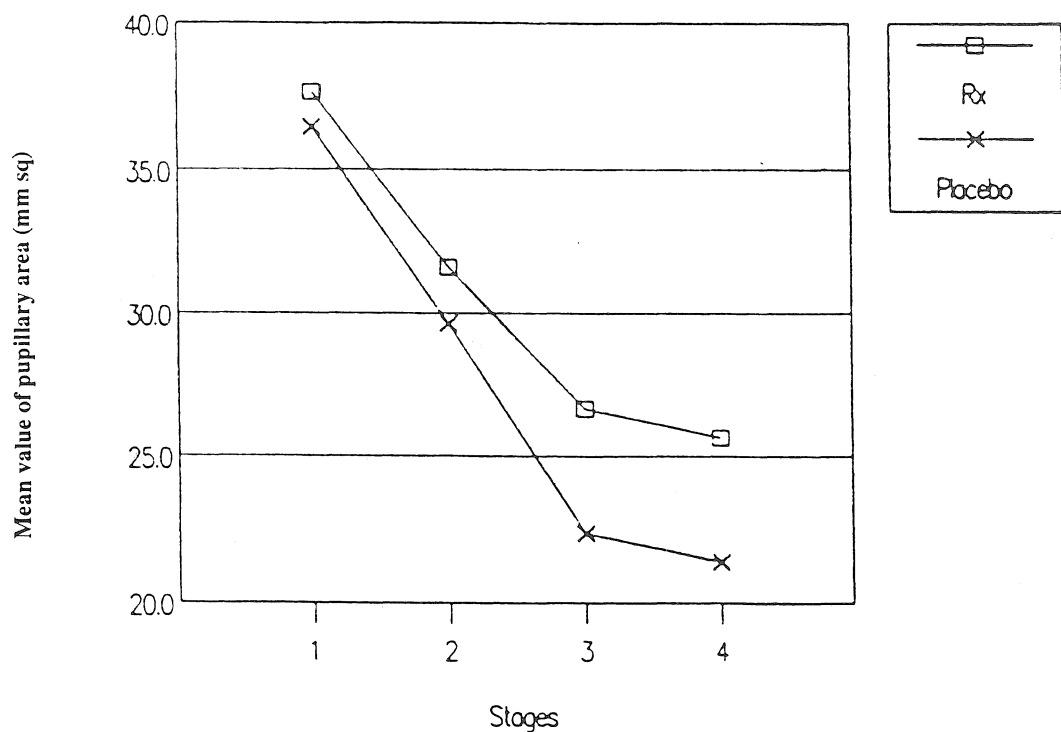


Fig. 2 : Mean Pupillary Areas of the Piroxicam (Rx) and Placebo Groups at Different Stages of the Procedure

and sex. Similar extracapsular cataract extraction technique were used for all patients. Standardised mydriatic drops were used in the preoperative dilatation of patients. The illumination intensity of the operating microscope was standardised because excessive light intensity may result in pupillary constriction. The total duration of the four stages of the procedure did not exceed 45 minutes in all patients. All pupillary diameters measurements were performed by a single observer. As regards to the side effects of the drug, piroxicam, none of the patients complained of any side effects.

Conclusion

This study has shown that there is a difference in the degree of miosis in patients in placebo group compared with those treated with piroxicam. Although this difference in pupillary diameters is small, the resultant pupillary areas obtained are larger in the piroxicam group and is of clinical significance. The larger pupillary areas in the piroxicam treated group is statistically significant at stages 3 and 4.

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