Journal of Optometry (2016) 9, 189–195

Journal of Optometry

www.journalofoptometry.org

ORIGINAL ARTICLE

Changes in ocular biometry and anterior chamber parameters after pharmacologic mydriasis and peripheral iridotomy in primary angle closure suspects

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Received 25 September 2015; accepted 3 January 2016
Available online 28 February 2016

KEYWORDS
Anterior chamber volume;
Peripheral iridotomy;
Mydriasis;
Narrow angle;
Ocular biometry

Abstract
Purpose: The aim of this study was to evaluate the effects of pharmacologic mydriasis and Peripheral Iridotomy (PI) on ocular biometry and anterior chamber parameters in primary angle closure suspects.
Methods: In this prospective interventional case series, 21 primary angle closure suspects were enrolled. Intraocular pressure, refraction, ocular biometry (Lenstar, LS900), and anterior chamber parameters (Pentacam HR) were measured at four occasions: before PI (before and after mydriasis with phenylephrine) and two weeks after PI (before and after mydriasis). The study was conducted on both eyes and only one eye per patient, in random, was included in the analysis.
Results: The mean age of the participants was 60 ± 7 years and 17 (81%) were female. There were no significant differences in intraocular pressure, refraction, keratometry, biometric and anterior chamber parameters between groups, except for anterior chamber volume, which showed increments with PI and mydriasis. The corresponding values for anterior chamber volume were as follows: 88.2 ± 13.7 mm^3 before PI, undilated; 106.3 ± 18.8 before PI, dilated; 99.0 ± 14.6 after PI, undilated, and 107.4 ± 16.5 after PI, dilated ($P < 0.001$).

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http://dx.doi.org/10.1016/j.optom.2016.01.001

Conclusions: This study showed no change in the ocular biometric and anterior chamber parameters including iridocorneal angle after PI and/or pharmacologic mydriasis except for increments in anterior chamber volume. This factor has the potential to be used as a numerical proxy for iris position in evaluating and monitoring patients with primary angle closure suspects after PI.

PALABRAS CLAVE
Volumen de la cámara anterior;
Iridotomía periférica;
Midriasis;
Ángulo estrecho;
Biometría ocular

Cambios en la biometría ocular y los parámetros de la cámara anterior tras midriasis farmacológica e iridotomía periférica en sospechas de cierre angular primario

Resumen
Objetivo: El objetivo de este estudio fue el de evaluar los efectos de la midriasis farmacológica y la iridotomía periférica (IP) en la biometría ocular y los parámetros de la cámara anterior en las sospechas de cierre angular primario.
Métodos: En esta serie de casos intervencional prospectiva, se incluyó a 21 sospechas de cierre angular primario. Se realizaron las mediciones siguientes: presión intraocular, refracción, biometría ocular (Lenstar, LS900), y parámetros de la cámara anterior (Pentacam HR) en cuatro ocasiones, antes de la IP (antes y después de la midriasis con fenilefrina) y dos semanas después de la IP (antes y después de la midriasis). El estudio se realizó en ambos ojos, incluyéndose en el análisis un solo ojo por paciente de manera aleatoria.
Resultados: La edad media de los participantes fue de 60 ± 7 años, de los cuales 17 eran mujeres (81%). No se hallaron diferencias significativas en cuanto a presión intraocular, refracción, queratometría, parámetros biométricos y de la cámara anterior entre los grupos, exceptuando el volumen de la cámara anterior, que reflejó incrementos con la IP y la midriasis. Los valores correspondientes para el volumen de la cámara anterior fueron los siguientes: $88.2 \pm 13{,}7\ mm^3$ antes de la IP, sin dilatación; $106.3 \pm 18{,}8$ antes de la IP, con dilatación; $99.0 \pm 14{,}6$ tras la IP, sin dilatación, y $107.4 \pm 16{,}5$ tras la IP, con dilatación ($P < 0{,}001$).
Conclusiones: El presente estudio no reflejó cambios en los parámetros biométricos oculares y de la cámara anterior, incluyendo el ángulo iridocorneal tras la IP y/o midriasis farmacológica, exceptuando los incrementos del volumen de la cámara anterior. Este factor tiene el potencial de ser utilizado como indicador numérico de la posición del iris al evaluar y supervisar a los pacientes con sospechas de cierre angular primario tras IP.

Introduction

Primary angle-closure glaucoma (PACG) is believed to be one of the leading causes of irreversible blindness worldwide, and it is estimated that 26% of 80 million glaucomatous patients by 2020 will have PACG.[1] It was reported that approximately 10% of people who have anatomically narrow angles (Primary Angle Closure Suspects, PACS) eventually develop angle closure glaucoma.[2] Factors that convert a PACS patient to acute primary angle-closure (APAC) or chronic angle-closure glaucoma (CACG) are unknown, and it would be of interest to know why certain eyes get involved with acute attack, some others with CACG, and some develop no sign of glaucoma. Therefore, any study about the anterior chamber (AC) parameters and ocular biometry may ultimately help us to learn more about the pathophysiology of glaucoma development in PACS.

The rationale for this study stems from the knowledge that in instances of increased ocular sympathetic tone, including emotional distress, low light conditions, or after sympathomimetic drug use, the iris dilator muscles contract and lead to pupil dilatation. The pupil dilation may result in pupillary block and development of APAC.[3] Moreover, it has been shown that AC parameters could be changed after pharmacologic mydriasis.[4] We aimed to measure any change in the ocular biometric characteristic and AC parameters using Lenstar LS 900 biometer (Haag-Streit AG, Koeniz, Switzerland) and Pentacam HR (Oculus, Wetzlar, Germany) before and after pharmacologic mydriasis in patient with PACS before and after Peripheral Iridotomy (PI).

Both Lenstar and Pentacam HR are among recently developed technologies that can objectively measure various AC parameters. Lenstar uses a partial coherence interferometer, and can measure several biometric parameters including central corneal thickness (CCT), central AC depth, lens