



ORIGINAL ARTICLE

Tear secretion and tear stability of women on hormonal contraceptives

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KEYWORDS

Injectable contraceptives;
Progesterone;
Tears;
Keratometer;
Schirmer's strips

Abstract

Purpose: To investigate the effects of injectable hormonal contraceptives on tear secretion and tear stability of females within child bearing age in Nigeria.

Methods: The experimental group consisted of 32 healthy females (mean age was 34.72 ± 5.44) on injectable hormonal contraceptives; and the control group comprised 32 females (mean age was 34.66 ± 5.24) who were not on hormonal contraceptives. The tear stability and tear secretion were measured using the non-invasive tear break up time (NITBUT) technique and Schirmer's strips, respectively. All the females were at follicular phase of menstrual cycle. The plasma levels of progesterone and estradiol of all subjects were determined.

Results: There were no remarkable effects of injectable hormonal contraceptives on tear secretion ($P=0.929$) and tear stability ($P=0.814$). There were weak correlations between the plasma levels of progesterone and tear secretion ($r=-0.232$, $P>0.05$), as well as with tear stability ($r=-0.322$, $P>0.05$). Also, there were weak positive correlation between plasma levels of estradiol and tear secretion ($r=0.304$, $P>0.05$), as well as with tear stability ($r=0.262$, $P>0.05$). There were no significant differences in tear stability between the experimental and control groups ($P>0.05$).

Conclusions: Injectable hormonal contraceptives had no significant effects on tear secretion and tear stability of healthy women of childbearing age. Further studies may be required to determine the effects of hormonal contraceptives on tear volume and stability of women with dry eyes.

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PALABRAS CLAVE

Anticonceptivos
inyectables;
Progesterona;
Lágrimas;
Queratómetro;
Tiras de Schirmer

Secreción y estabilidad de la lágrima en mujeres sometidas a anticoncepción hormonal**Resumen**

Objetivo: El estudio tuvo como objetivo la investigación de los efectos de los anticonceptivos hormonales inyectables sobre la secreción y la estabilidad de la lágrima en mujeres en edad fértil en Nigeria.

Métodos: El grupo experimental estaba compuesto por 32 mujeres sanas (edad media de $34,72 \pm 5,44$ años) sometidas a terapia anticonceptiva hormonal inyectable; y el grupo de control incluía a 32 mujeres (edad media de $34,66 \pm 5,24$ años) no sometidas a anticoncepción hormonal. La estabilidad y la secreción de la lágrima se midieron mediante la técnica NITBUT (tiempo de ruptura de la capa lipídica de la lágrima) y las tiras de Schirmer, respectivamente. Todas las mujeres se hallaban en la fase folicular del ciclo menstrual. Se determinaron los niveles de progesterona y de estradiol de todas las pacientes.

Resultados: No se hallaron efectos destacables de los anticonceptivos hormonales inyectables sobre la secreción ($P=0,929$) y la estabilidad de la lágrima ($P=0,814$). Se produjeron correlaciones leves entre los niveles de plasma de la progesterona y la secreción de la lágrima ($r=-0,232$, $P>0,05$), y la estabilidad de la lágrima ($r=-0,322$, $P>0,05$). También se halló una débil correlación entre los niveles de plasma del estradiol y las secreción de la lágrima ($r=0,304$, $P>0,05$), y la estabilidad de la lágrima ($r=0,262$, $P>0,05$). No se produjeron diferencias significativas en cuanto a estabilidad de la lágrima entre los grupos experimental y de control ($P > 0,05$).

Conclusiones: Los anticonceptivos hormonales inyectables no tienen efectos significativos sobre la secreción y la estabilidad de la lágrima en las mujeres sanas en edad fértil. Pueden precisarse estudios adicionales para determinar los efectos de los anticonceptivos hormonales sobre el volumen y la estabilidad de la lágrima en mujeres con ojo seco.

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Introduction

The endocrine system exerts significant influences on the physiology and pathophysiology of the lacrimal gland. Androgens, estrogens and progestin have been identified in the tear film and their levels in the tears appeared to correlate with those of the serum.¹ Receptors for androgens, estrogens, progesterone and prolactin have been found in several ocular tissues of rats, rabbits and humans. These hormones regulate the immune system, secretory functions of lacrimal and the meibomian glands.^{2,3} Thus the eye is a target organ for sex hormones. Rocha et al.⁴ reported that androgen, estrogen and progesterone receptors mRNAs were present in the epithelial cells of the lacrimal gland, meibomian gland, lid, palpebral and bulbar conjunctivae, cornea, uveal body, lens, and retina of humans. These observations demonstrate that sex steroid receptors mRNAs exist in a variety of ocular tissues. It was suggested that these receptors in the eye might be target sites for androgens, estrogen and progestin; and that these sites might also be susceptible to administered topical and systemic hormonal contraceptives. Several authors reported that these sex steroids (i.e. androgens, estrogens and progestin) modulate the structural characteristics, functional attributes and pathological features of ocular tissues. These observations had accounted for the gender-related differences in dry eyes.⁵⁻⁷

Injectable contraceptives are hormone shots administered to some women in order to prevent pregnancy. An estimated 16 million women throughout the world use hormonal contraceptives.⁸ There are controversies on the effects of the injectable hormonal contraceptives on tear

physiology and tear production of women. Sullivan et al.³ suggested that hormonal contraceptives improved the quality and the production of tear film, but other authors⁹ reported that the hormone increases the risk of dry eyes in women. Some researchers¹⁰⁻¹² proposed also that either the topical or systemic application of estrogens might ameliorate the symptoms of dry eyes. There were other suggestions that oral contraceptives containing estrogen might decrease tear volume and reduce tear break-up time. It was also suspected that estrogen oral contraceptives might attenuate mucous production, increase foreign body sensation, reduce contact lens intolerance, decrease visual acuity and increase the risk of dry eyes in women using the drugs.^{3,13,14} It has been recorded that post-menopausal women under hormone replacement therapy (HRT), particularly estrogen alone, were at risk of dry eyes syndrome.⁹ These controversies prompted this study, aimed at investigating the effects of injectable contraceptives on tear secretion and stability of women within child bearing ages.

Methods

The study was a prospective study carried out in the Department of Optometry, University of Benin, Benin City, Nigeria. The participants comprised sixty four (64) healthy women of child bearing ages, within the age bracket of 26–45 years. They were healthy female volunteers from the family planning clinic, Department of Obstetrics and Gynaecology, University of Benin teaching hospital, Benin City, Nigeria. The subjects consisted of 32 females, who were current users of injectable contraceptives. The control group consisted

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