

SHORT COMMUNICATION

Avicenna's Description of Corneal Edema: The Early Report in the History

Abstract

Corneal edema is an ophthalmic disorder which has two causes; one of them is increasing intraocular pressure that is the result of glaucoma and another reason is decompensation of endothelium that includes inflammatory and non-inflammatory types. Although, it is believed that this disorder is a new concept in medicine, reviewing the Avicenna's Canon of Medicine (written in 1025AD) show that Avicenna described this disorder under the title of *Saratan-e Cheshm*. He has defined it and also described its sign and symptoms like exquisite pain, elongation of eye vessels, needle irritation, and redness of the eye, headache, anorexia, and hurt from looking at the things have humility. It can be considered as the first complete describing of corneal edema as a sole ocular disorder in the history.

Key words: Persian medicine, Ophthalmology, Corneal edema, Medieval history

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Introduction

Corneal edema is an ophthalmic disorder which has two causes; one of them is increasing intraocular pressure that is the result of glaucoma and another reason is decompensation of endothelium that includes inflammatory and non-inflammatory types. Inflammatory type can cause due to infection with herpes simplex virus (HSV) and herpes zoster virus (HZV).^{1,2} In this process, peripheral corneal edema and increasing intraocular pressure would be induced following decreasing intracorneal water migration in the corneal periphery.^{3,4} Although, it is believed that corneal edema is a new concept of medicine, there are some evidences from ancient era that show such concepts were to some extent familiar for the physicians. The first report of the signs of herpetic infections dates back to more than 2000 years ago when Herodotus (the Greek historian) described it as creeping skin disease in his book.⁵ Also, Hippocrates (Greek physician in 400 BC) noticed to an ocular disease lead to blindness.⁶ It was similar to glaucoma related to corneal edema. Although, these issues were not exactly description of corneal edema, there were first preliminary concepts to find this disorder. But, contrary with the accepted idea as finding ocular edema in current era; there are some other historical evidences show that this disorder was well known for Persian physicians like Avicenna about 1000 years ago.

Avicenna (980-1032AD)

This study is based on reviewing the Persian translation of third volume of the book of Canon of Medicine, originally written by Avicenna (Figure 1) in 1025AD. Avicenna (980-1025AD) was a Persian physician and scientist who had the effective role in progress and development of medical sciences during the history. Avicenna had more than 400 books and treaties in various branches of science, in particular medical sciences. His great comprehensive medical text book was the Canon of Medicine. He wrote this book in 5 volumes in Arabic, as the *lingua franca* of that time. This book consists of whole medical and pharmaceutical sciences in that era. Later, the Canon was translated into Latin and became one of the main medical text books in the east and the west for centuries at least until 17th century AD.⁷

Avicenna's Description of Corneal Edema

Avicenna propounded a phenomenon describing eye cancer (*Saratan-e-Cheshm*; *Saratan* means cancer; *-e-* means of; and *Cheshm* means eye) in the sixth chapter of the third volume of the Canon of Medicine. Avicenna indicated that this disorder would be placed on the outer layer of corneal.⁸ It is known

1. Levenson, 2016:190-204.
- 2- Morishing, 2016:602-606.
- 3- Ytteborg, 1965:477-484.
- 4- Inoue, 2016: 349-356.
- 5- Marques, 2000: 328-359.
- 6- Tsatsos, 2007: 1561-1562.
- 7- Zargaran, 2012: 389-90.
- 8- Avicenna, 2010:224.





Figure 1. Avicenna Statue, located in Keshavarz Street, Near the Tehran University Campus, Tehran, Iran

that outer layer of cornea (epithelium) is damaged in the most of the viral effects that cause loss glassiness of the cornea.⁹ The herpes viruses which cause corneal edema have early clinical symptoms into shape of epithelial edema.¹⁰

Avicenna also described the sign and symptoms of this disorder as exquisite pain, elongation of eye vessels, needle irritation, and redness of the eye, headache, anorexia, and hurt from looking at the things have humility.¹¹ Such sign and symptoms are similar to the corneal edema sign and symptoms. It is well accepted that the signs and symptoms of corneal edema are including pain in eye and headache as well as blurred vision cause due to increasing pressure of the eye and also inflammatory.¹² Also, ocular inflammation can cause redness in the eyes.¹³ Other ones are vasospasm¹⁴ and sensing the irritation and coloured haloes and also decreasing the acuity of eye.^{15,16} On the other hand, ocular HSV infection causes photophobia¹⁷ and irritation and photophobia may lead to anorexia nervosa.¹⁸

According to symptoms and the place of happening, this disease is discussed as a corneal edema and obviously it is not eye cancer. Of course, it is understandable that Avicenna's definitions of cancer could be different with current terminology and it was only a similarity in meanings of the words.

- 9- Hamrah, 2012: 1791-1797.
- 10- Levenson, 2016:190-204.
- 11- Avicenna, 2010:224.
- 12- Behrens, 1978: 507-521.
- 13- Tarff, 2017: 615-639.
- 14- Flammer, 2001: 319-349.
- 15- Aquavella, 1973: 201-207.
- 16- Sood, 2010: 158-163.
- 17- Whitley, 2002: 6-11.
- 18- Gaudiani, 2012: 928-930.



It seems that Avicenna knew completely this disorder and its sign and symptoms and called it as *Saratan-e-Cheshm* in his medical text.

Conclusion

By comparing Avicenna's words with sign and symptoms of corneal edema, it seems that he described corneal edema as *Saratan-e-Cheshm* in his Canon of Medicine. It can be considered as the first complete describing of corneal edema as a sole ocular disorder in the history.

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