

DEFINITION

1. Glaucoma is a condition of the eye in which there is increased intra-ocular pressure, which may be persistent or recurrent. It is essentially a symptom of a change in the structure of the eye and not a disease entity in its own right.

GENERAL CONSIDERATIONS

2. The **aqueous chamber** of the eye is bounded in front by the **cornea** and behind by the **lens** and its **suspensory ligament**.
3. The **iris** divides the aqueous chamber into an **anterior** and a **posterior chamber**, the former being in front of the iris and the latter between the iris and the lens. The two chambers communicate through the **pupil**.
4. The portion of the anterior chamber between the junction of the iris with the cornea is described as the **filtration angle**.
5. The fluid circulating in the aqueous chamber - the **aqueous humour** - is derived in complex fashion from the blood stream and nourishes the anterior portion of the eye. Its circulation depends largely on the integrity of the filtration angle, where it escapes through drainage channels.
6. While fluctuations in intra-ocular pressure occur normally as a result of, for instance, changes in the capillary pressure and/or permeability, **sustained** increase in pressure - glaucoma - may be due to:
 - 6.1. an increase in the formation of aqueous humour
 - 6.2. difficulty in the drainage of aqueous humour
 - 6.3. raised pressure in the episcleral veins.
7. Of those factors mentioned in Paragraph 6 above, 6.1 and 6.3 are of little importance. It, therefore, follows that glaucoma is essentially due to an obstruction to the circulation of the aqueous at the pupil, or to its drainage through the filtration angle.

CLASSIFICATION**PRIMARY GLAUCOMA**

8. This is a condition caused by raised intra-ocular pressure without antecedent ocular disease. It occurs in two forms -
 - 8.1. **Closed angle glaucoma**
 - 8.2. **Simple glaucoma.**

SECONDARY GLAUCOMA

9. This follows some pre-existing disease of the eye, particularly inflammatory conditions. It may show the characteristics of either 8.1 or 8.2 above.

CLINICAL MANIFESTATIONS

10. The diagnosis of glaucoma depends on three objective findings -
 - 10.1. raised intra-ocular tension
 - 10.2. cupping of the optic disc, observed by ophthalmoscopic examination
 - 10.3. defects in the visual field.
11. Closed angle glaucoma is characterised by sudden episodic subacute attacks of raised tension, the most notable features of which are diminution of vision and the subjective appearance of halos caused by corneal oedema. The eye may seem to recover from the less severe attacks, but subsequent episodes tend to involve a permanent raising of the tension (**chronic congestive glaucoma**), which may result in blindness (**absolute glaucoma**). An acute attack may, of itself, abolish vision. The condition is almost always bilateral.
12. Simple glaucoma presents an entirely different clinical picture, being quietly and slowly progressive and practically symptomless. Mild headaches and eye-aches may occur whilst reading, and close work may present increasing difficulties requiring an increase in strength in spectacle lenses. An observant patient may notice a defect in the visual field, which gradually contracts, especially on the nasal side. The central vision remains unaltered until a late stage, both eyes are invariably involved and, without treatment, blindness eventually results.
13. The clinical manifestations of secondary glaucoma are sometimes overshadowed by those of the causal disease. Depending on the primary cause, one or both eyes may be involved, and the course of the condition may resemble either of the primary forms.

AETIOLOGY

PRIMARY GLAUCOMA

14. World-wide surveys suggest that the incidence of glaucoma is in the region of 2% of the population over 40 years of age, and it affects all races.
15. Investigation of racial, geographical, climatic, cultural and nutritional differences has shown an absence of any external factor as a cause of primary glaucoma.

16. **Closed angle glaucoma** usually occurs in the fifth and sixth decades of life, although it may occur earlier or later, and is more common in females. It is particularly seen in those who are anxious in disposition. The type of eye affected is characteristic, being hypermetropic (long-sighted) with a shallow anterior chamber, these characteristics being genetically determined. The lens-iris diaphragm is far forward and the filtration angle narrow. The latter feature is a constant characteristic and is often hereditary. The narrowness of the angle does not become apparent, however, until the fourth or fifth decade when advancing years lead to growth of the lens, thus exaggerating that which has been present since birth. However, by no means every eye with a narrow angle develops glaucomatous attacks. Blockage is more likely to occur when the pupil is dilated and the iris relaxed. Thus, acute episodes may be induced by emotional or mental stress, insomnia and any factors which cause dilation of the pupil, such as certain drugs or periods spent in the dark.
17. **Simple glaucoma** occurs predominantly in the seventh decade or later, in either sex, and in people of no specific psychological pattern. The condition occurs with any type of filtration angle which, as is found in the population generally, is therefore usually wide. No specific cause has been isolated, but it may be presumed in general to be due to inefficiency of the drainage channels, so that they are permeable with difficulty and the base pressure rises as a consequence, this being thought to result from polygenic inheritance. No external factors have been identified which influence the condition.

SECONDARY GLAUCOMA

18. A rise in intra-ocular pressure secondary to pre-existing ocular disease is not uncommon. Conditions which may cause secondary glaucoma are -
 - 18.1. adhesions of the iris due to penetrating wounds of the cornea or to perforation of corneal ulcers
 - 18.2. ocular haemorrhage
 - 18.3. dislocation of the lens
 - 18.4. traumatic cataract
 - 18.5. intra-ocular tumours
 - 18.6. uveitis
 - 18.7. thrombosis of the central vein or artery of the eye
 - 18.8. prolonged steroid therapy, local or systemic.
19. The aetiology of secondary glaucoma is that of the primary condition.

CONCLUSION

20. Glaucoma is a condition in which the pressure of the fluid in the eyeball rises. Closed angle primary glaucoma is predisposed by genetic inheritance, but may be induced in susceptible individuals by certain external factors. Simple primary glaucoma occurs in those who have inherited a number of abnormal genes. Secondary glaucoma may arise as a consequence of other ocular disease.

REFERENCE

Miller Stephen J H. Parsons' Diseases of the Eye. 18th Ed. Churchill Livingstone. Edinburgh. 1990.

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