Case Report

A Case Series of Waardenberg Syndrome

Nausheen Hayat, Alyscia Cheema

Pak J Ophthalmol 2014, Vol. 30 No. 3

See end of article for authors affiliations

Correspondence to:
Nausheen Hayat
C-61, Darakhshan Villas
Phase-6, DHA, Karachi
Ph: 0321-2101888

Waardenburg syndrome (WS) is a rare autosomally inherited and genetically heterogeneous disorder of neural crest cell development with distinct cutaneous manifestations[1]. We report here a case series of patients of a single family, presented with assemblage of complete heterochromia, dystopia canthorum, synophrys and broad nasal root. Other family members with presence of heterochromia and telecanthus have been delineated in pedigree. In our case series second generation of family also found to be affected, which is rarely reported till now. To our knowledge no local cases have been reported till date.

Key words: Waardenberg syndrome, Heterochromia, Telecanthus.

Waardenburg syndrome is a rare disease characterized by deafness in association with pigmentary anomalies and defects of neural crest-derived tissues[1].

Above mentioned case was first reported in 1951, by a geneticist P. J. Wardenberg who potrayed it along with the 6 main features. Those features are Lateral displacement of the medial canthi combined with dystopia of the lacrimal puncta and blepharophimosis, Prominent broad nasal root, Hypertrichosis of the medial part of the eyebrows, White forelock, Heterochromia iridis, Deafmutism[2].

Waardenberg syndrome is divided into four sub types; this division is based on the presence and absence of dystopia canthorum along with other certain clinical features. These subtypes are WS_1, WS_2, WS_3 and WS_4. It affects equally both sexes and all races[3].

It is estimated that 1 per 10,000 - 20,000 people are diagnosed with waardenberg syndrome, with a prevalence rate of approximately 1 in 10,000 or 0.01% in US[4].

Among four types of syndrome, I and II are the most common, whereas types III and IV are rare.

Five major and five minor criteria exist for diagnosing WS. The major criteria are sensorineural hearing loss, iris pigmentary abnormality (two eyes different color or iris bicolor or characteristic brilliant blue iris), hair hypopigmentation (white forelock or white hairs at other sites on the body), dystopia canthorum (lateral displacement of inner canthi) and the presence of a first-degree relative previously diagnosed with WS. The minor criteria are skin hypopigmentation (congenital leukoderma/white skin patches), medial eyebrow flare (synophrys), broad nasal root, hypoplasia of alae nasi, and premature graying of hairs (before age 30)[3].

CASE REPORT

Our first patient is a 22 year old male presented to the outpatient department of our tertiary eye care hospital with chief complaints of difference in color of his eyes with decreased vision in right eye (Fig. 1). His Best corrected visual acuity at presentation was 6/24 p OD with -3.50 x -1.00 at 90 degree and 6/6 OS. Patient also has complain of decreased hearing in right ear. He was the last child of a non-consanguineous marriage among 7 siblings with one affected brother as well. (3 brothers and 3 sister). His birth and developmental history did not reveal anything significant. His detailed family history revealed that his mother has telecanthus along with 1 brother and 2 nephews and 2 nieces affected as well.

On systemic examination, he was moderately built with an average height, weight and normal IQ. He had premature graying of hair with absence of any associated depigmentation elsewhere on the body. His ENT and abdominal examinations were normal.

On ocular examination, gross inspection shows broad nasal root and synophrys. The palpebral fissure height of right eye was 1.5 cm and 1.4 cm in left eye along with lateral displacement of canthi. He also had dystopia canthorum with interpupillary distance of 8cm and inner canthal distance of 5.7 cm. Hirschberg corneal reflex was central but medially sclera was visible o a lesser extent.

Complete heterochromia due to hypoplastic iris, blue in color was noted in right eye (Fig. 2). Sectoral atrophy of iris seen in left eye. Besides this anterior

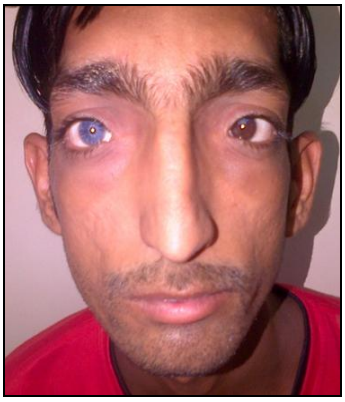
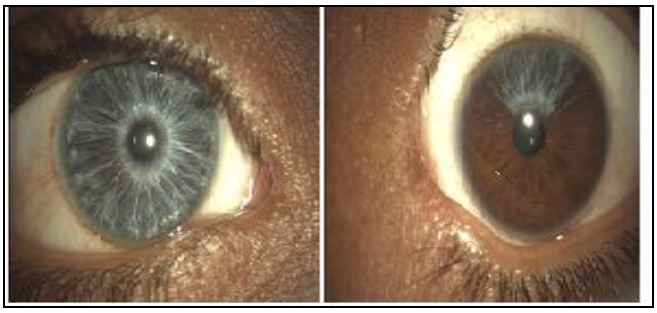
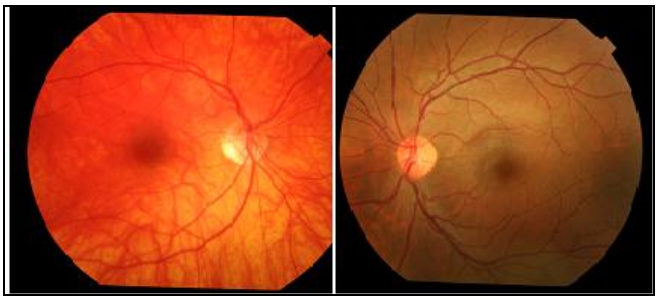


Fig. 1: Shows telecanthus.



Right Eye **Left Eye**

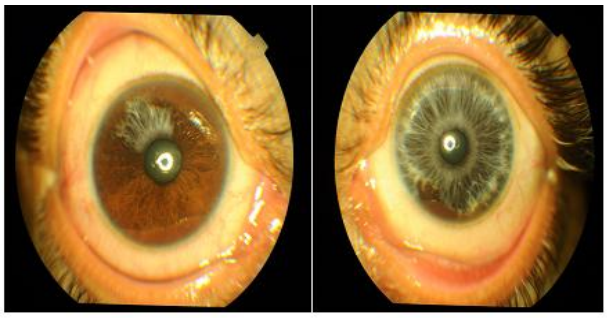
Fig. 2: Shows anterior segment



Right Eye **Left Eye**

Fig. 3: Shows right hypopigmented fundus

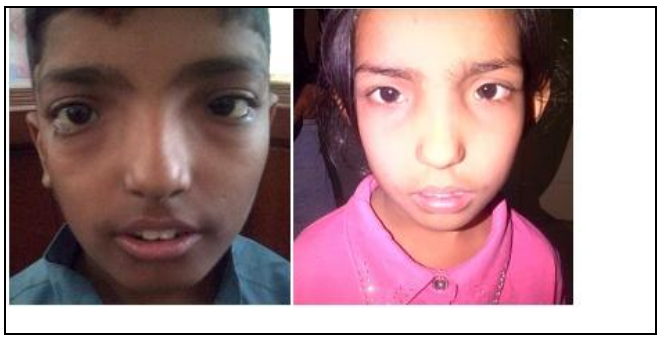
Fig. 4: Shows telecanthus, synophrys and heterochromia left eye



Right Eye **Left Eye**

Fig. 5: Anterior segment

2 children of elder brother (our 3rd and 4th patient) showed only telecanthus and broad nasal root in examination with rest of the examinations normal.



Nephew **Niece**

Fig. 6: Shows telecanthus and broad nasal root.

segment examination was otherwise normal in both the eyes. IOP was in normal limits. Pupillary reactions were normal. Right fundus was albinotic showing hypopigmentation and temporal disc pallor and left fundus was normal (Fig. 3). Gonioscopy revealed

grade IV angle in both eyes, normal iris vessels seen in angle of right eye.

Our second patient is 46 years old male, elder brother of patient. His history revealed presence of white forelock of hairs at birth (due to hair dying at early age patient has no old picture) and premature graying of hairs, dystopia canthorum, synophrys and heterochromia irides. His visual acuity was 6/6 in both eyes. Right eye shows sectoral iris atrophy and complete heterochromia found out in left eye. Both fundii were normal.

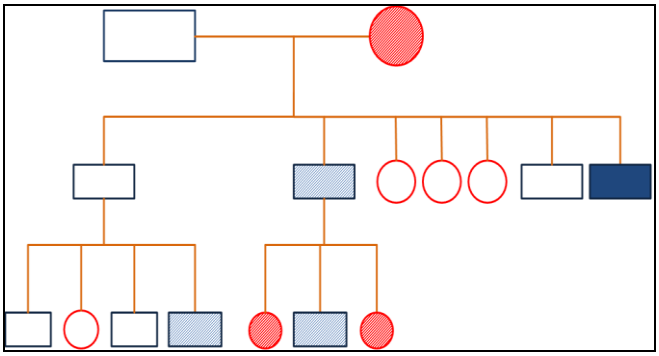


Fig. 7: Pedigree chart.
Dark blue box: first patient. Light blue box: other affected males. Red circles: affected females.

DISCUSSION

Waardenburg consortium proposed diagnostic criteria for diagnosing WS types. According to it, for placing patient in category of WS I, patient should have 2 major or 1 major + 2 minor criteria present. WS II is characterized by sensor neural hearing loss and heterochromia iridis but absence of dystopia canthorum. WS III (Klein–Waardenburg syndrome) resembles type I with supplementary musculoskeletal abnormalities. These patients have hypoplastic muscles and contractures of the upper limbs. WS IV is associated with Hirschsprung disease. Liu et al. suggested method for diagnosis of WSII, which requires presence of at least two major criteria and the same study propounded the use of premature graying as one of the mature criteria instead of dystopia canthorum[5].

We present a case series of a single family with several members affected of first and second generation. According to the above mentioned criteria our first and second patient falls in category of WS 1. since all of these are only cosmetic problems therefore they do not require compulsory treatment.

It is plausible that in certain cases WS may remain undiagnosed until other family members with similar features seek medical attention. One of the purposes to present this case series is to bring in light the significance of detailed examination of all the family members to recognize undiagnosed cases. Clinical features of WS are mainly cosmetic problems for which no definitive treatment exist, except for few occuloplastic procedures which can be done for broad medial canthus. In some cases muted diseases, such as, Sensorineural deafness, bony abnormalities or Hirschsprung disease are found to be associated with WS which results in deterioration in quality of life. An ophthalmologist can help these patients by making an early diagnosis which may aid in the initiation of early treatment, social and vocational training, and rehabilitation of these patients.

ACKNOWLEDGEMENT

We would like to express our special thanks to Prof. Hassan Niazi for his valuable guidance and advise during diagnosis and workup of this patient.

Author's Affiliation

Dr. Nausheen Hayat
Ophthalmology Ward
Jinnah Post Graduate Medical Centre
Karachi

Dr. Alyscia Cheema
Head of Department
Ophthalmology Ward
Jinnah Post Graduate Medical Centre
Karachi

REFERENCES

1. **Eglabian F**. Waardenberg-Shah syndrome; a case report and review of literature. Iran J Pediatr. 2008; 18: 71-4.
2. **Waardenberg PJ.** A new syndrome combining developmental anomalies of the eyelids, eyebrows and nose root with pigmentary defects of the iris and head hair and with congenital deafness. Am J Hum Genet. 1951; 3: 195-253.
3. **Ghosh SK, Bandyopadhyay D, Ghosh A, Biswas SK, Mandal RK.** Waardenberg syndrome: a report of three cases. Indian J Dermatol Venereol Leprol. 2010; 76: 550-2.
4. Right diagnosis.com. Denver (CO): Health Grades Inc; 2011. Statistics by country for Waardenberg syndrome. 2013; 7.
5. **Bansai Y, Jain P, Goyal G, Singh M, Mishra C.** Waardenberg syndrome-a case report. Clae. 2012; 36: 49-51.