

# Visual acuity in patients with retinitis pigmentosa

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## Abstract

**Objective:** The present study is taken up to learn the visual acuity in patients with retinitis pigmentosa (RP).

**Methods:** The current study was conducted in thirty male and female patients with in age group of 30-50 years and thirty age matched controls with retinitis pigmentosa. Vision testing was conducted by trained optometrician. Visual acuity was tested for distance vision using Snellen's test type placed at a distance of 6 meters from the student and near vision using near vision test type with the student holding the chart in his/her hand at a distance of approximately 30 cms from the face. Data was analyzed by SPSS 20.0. Statistical test used are student t test. P value less than 0.05 was considered significant. **Results:** There was no significant difference between cases and controls in demographic data. Decline in the visual acuity was more prevalent in cases when compared to controls. **Conclusion:** We have observed decline in the visual acuity in the patients with retinitis pigmentosa. We recommend further detailed studies in this area.

**Key words:** Visual acuity, Retinitis pigmentosa, Eye disorders

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## Introduction

Retinitis pigmentosa (RP) a hereditary, progressive disease associated with night blindness and visual field defects (Side vision) noticed in midperipheral area. The disease not only affects rod photoreceptors but also leads to the gradual degeneration of foveal cone photoreceptors further causing peripheral visual field restriction [1]. In short in RP, the rod cells and eventually the cone cells stop working, causing vision loss. The quality of vision is not affected in the early stage of RP but the field of vision is reduced.

There are several ways in practice like focal macular electroretinogram (fmERG), best-corrected visual acuity (BCVA), contrast visual acuity (CVA) and central visual field to assess the central visual function in RP. Visual acuity (VA) in ideal conditions is used to evaluate the maximum VA. Prior to the VA loss if there is any minute decrease in visual function can be evaluated by CVA [2]. Certain studies stated that even mild VA losses show reduced CVA and contrast sensitivity

(CS) measurements in RP patients [3,4,5,6,7]. As it is known that there is no therapy to cure RP, despite the lack of treatment it is very important for the patients to have regular eye check-ups as the RP patients are prone to other type of eye problems that can further effect the general population too. Regular visits to an RP specialist can also make you aware of current advances as we learn more about RP and treatments that may help you.

## Aims and Objectives

The present study is taken up to learn the visual acuity in patients with RP.

## Materials and Methods

**Study design:** Case control study

**Setting:** The study was conducted at King Fahad Hospital, Saudi Arabia

**Participants:** The current study was conducted in thirty male and female patients with retinitis pigmentosa in age group of 30-50 years and thirty

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## Original Research Article

age matched controls. Vision testing was conducted by trained optometrician.

Visual acuity was tested for distance vision using Snellen's test type placed at a distance of 6 meters from the student and near vision using near vision test type with the student holding the chart in his/her hand at a distance of approximately 30 cms from the face [8].

The following criteria was used for selecting patients.

**Inclusion criteria:** Patients diagnosed with retinitis pigmentosa, willing participants with in the age group of 30-50 years were included in the study.

**Variables**

**Visual acuity:** Visual acuity was measured by standard methods mentioned in the literature.

**Statistical analysis-** Data was analyzed by SPSS 20.0. Statistical test used are student t test. P value less than 0.05 was considered significant.

**Results**

Table 1 presents demographic data of the participants. There was no significant difference between cases and controls in demographic data. Decline in the visual acuity was more prevalent in cases when compared to controls (table 2).

**Table No 1: Demographic data of participants**

Parameter	Cases	Controls	P value
Age ( years)	38.3±4.2	36.51±3.54	0.0795
Height (cm)	156.42±12.36	158.21±14.58	0.6099
Weight (kg)	67.24±8.53	68.21±6.58	0.6238

Data was presented as mean ± SD. (\*P<0.05 is significant, \*\*P<0.01 is significant, \*\*\*P<0.001 is significant). Demographic data was not significant between cases and controls.

**Table No 2: Visual acuity in cases and controls.**

Visual acuity	Cases (n=30) (frequency & Percentage)	Controls (n=30) (frequency & Percentage)
20/20	0(0%)	5(16.66%)
20/30	0(0%)	15(50%)
20/40	3(10%)	2(6.6%)
20/50	1(3.33%)	1(3.33%)
20/60	8(26.66%)	1(3.33%)
20/70	2(6.66%)	1(3.33%)
20/80	6(20%)	4(13.33%)
20/90	3(10%)	0(0%)
20/100	6(20%)	1(3.33%)
20/160	1(3.33%)	0(0%)

Data was expressed as frequency and percentage. Decline in the visual acuity was more prevalent in cases when compared to controls.

## Discussion

A set of hereditary retinal diseases characterized by the rod and cone photoreceptors degeneration is termed as Retinitis pigmentosa (RP). About 1 in 4000 is the prevalence of RP wherein a million of individuals are affected worldwide. The disease is inherited and can be inherited as X-linked trait (Approximately 5-15% of the cases), autosomal-dominant (30- 40%) or autosomal-recessive (50-60%) [9, 10, 11].

A study conducted in Japan reported that RP is the major cause for visual blindness. The study showed that 25% of the patients suffering with visual problems were due RP [12]. A similar result was noted in a study conducted in Kuwait, stating RP as a major leading cause of visual disability in the individuals less than 60 years of age [13]. A study in Denmark accounted blindness in around 29% of the cases between the age group 20- 64years and learnt that the leading causes for blindness were retinitis pigmentosa and optic neuropathy [13].

Symptomatic vision loss is noted in few patients in childhood whereas few remain asymptomatic until midadulthood. It is observed that there will be the loss of midperipheral visual field at young followed by gradual decrease of far peripheral vision and finally lead to the loss of central vision. Loss of night vision is often unnoticed as the work at night is done under sufficient light and using of spectacles also helps in proper vision.

1 in every 4000 are affected with retinitis pigmentosa, this is the worldwide prevalence. The disease may be X-linked inherited (5-15%) or autosomal dominant (30-40%) or autosomal recessive (50-60%) [14,15,16]. A study conducted in Kuwait, stated that retinitis pigmentosa is the most common cause for visual disability in individuals with less than 60 years [17]. A study in Denmark, accounted 29% of the cases related to blindness is due to retinitis pigmentosa whereas, Japan accounted 25% of the cases between 20 to 60 years of age [18,19]. The disease usually confined to eye, but found that about 20-40% of the cases can be associated as non-ocular disease i.e; the disease is associated with hearing impairment (Usher's syndrome).. Retinitis pigmentosa when associated with obesity [20] hypogenitalism, polydactyly, renal disorders and cognitive

impairment is known as Bardet-Biedl syndrome. The disease is highly variable, it develops symptomatic vision loss in patients in childhood and in some it may remain asymptomatic till mid-adulthood [21,22]. In adulthood most of them report difficulty with dark adaptation, night blindness and loss of mid-peripheral vision field further leading to tunnel vision, when untreated and by 60 years it may lead to complete loss of central vision too. Most of the retinitis pigmentosa forms show excess of loss of rod function than the reduction of cone sensitivity.

The reversal pattern may be occasionally seen which is termed as cone-rod degeneration [23]. In other forms there is an equal decline in rod and cone functioning. The most prominent and early symptoms of this disease is defective colour vision and loss of visual acuity. Typical signs would be difficulty in undertaking daily activities and impairment in reading and this is observed when there is a fall in visual acuity below 0.5 (20/40) [24,25].

The present study also showed that RP leads decrease in visual acuity. Researchers focus, efforts and interest on the therapeutic approaches for RP promises for the sophisticated treatments further in the coming 10 years.

## Conclusion

We have observed decline in the visual acuity in the patients with retinitis pigmentosa. We recommend further detailed studies in this area.

**Contributions:** All the authors equally contributed in designing the study, collection of data, analysis and interpretation and writing the article.

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**Permission from IRB:** Yes

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