Color Vision Impairment: a preliminar comparison among Idiopathic Parkinson, Essential Tremor, Parkinsonism, early Parkinson's Disease

A Piro, A Tagarelli, G Nicolatti, M Caracciolo, F Rocca, M Morelli (1), G Arabia (1), A Quattrone

National Researches Council of Italy, Bioimaging and Molecular Physiology Institute, Research Section, Germaneto, Catanzaro, Italy
(1) Institute of Neurology, Magna Graecia University, Catanzaro, Italy

INTRODUCTION

Defective color vision can be acquired as a result of ocular or general pathology, intracranial injury or by the prolonged use of some therapeutic drugs. They can progress from normal trichromatism to anomalous trichromatism on to a dichromatic stage and to monochromatism where most color vision is lost, or they may be relatively stable. The importance of the color vision as a diagnostic marker for the neurological diseases is showed in the present work

PATIENTS AND METHODS

47 Calabrian males were enrolled (age range 38-80; mean age 53,5): Idiopathic Parkinson's Disease, 15; essential tremor, 9; Parkinsonism, 9; Early Parkinson's Disease, 14. 47 controls were matched for sex and age. All had an ophthalmologic examination to exclude diabetic retinopathy, cataract, optic neuritis, fundus anomalies. Ishihara test, The City University Test, Farnsworth D15 Test were used monocularly, and binocularly

RESULTS

The table shows the obtained results within the different considered groups

Color Vision in Idiopathic Parkinson, Essential Tremor, Parkinsonism, early Parkinson's Disease

Idiopathic Parkinson sample	Ishihara errors	Farnsworth errors	City University errors	Diagnosis
B.F.	2	0	0	normal
C.S.	1	0	0	normal
T.G.	1	3	0	normal
G.G.	3	1	0	normal
A.V.	0	2	0	normal
C.R.	2	3	0	normal
S.S.	2	4	0	normal
C.A.	1	10	8	**tritan**
G.G.	2	0	1	normal
I.P.	2	4	3	**protan**
R.S.	5	6	1	**tritan**
Essential Tremor sample				
C.A.	1	0	0	normal
C.A.	0	0	0	normal
M.O.	1	4	0	normal
C.V.	2	0	0	normal
M.G.	0	2	0	normal
R.M.	0	0	0	normal
S.G.	0	0	0	normal
G.E.	0	0	0	normal
B.P.	1	0	0	normal
Parkinsonism sample				
A.P.	0	9	1	**tritan**
C.F.	2	7	1	normal
T.Q.	1	3	0	normal
G.F.	0	4	0	normal
C.A.	0	5	1	**tritan**
S.A.	2	12	2	**tritan**
N.M.	5	9	4	**tritan**
Early Parkinson's disease sample				
F.C.	3	0	0	normal
D.N.	1	0	0	normal
M.C.	1	0	0	normal
F.A.	1	0	0	normal
C.G.	1	0	0	normal
F.G.	1	2	0	normal
B.S.	1	1	0	normal
G.D.	0	0	0	normal
O.V.	2	0	0	normal
F.S.	1	0	0	normal
L.A.	2	0	0	normal
T.A.	2	3	0	normal
S.D.	2	0	0	normal

CONCLUSION

At today, the present work resulted to be the first comparing two neurological diseases, Parkinson's Disease, and Essential Tremor; these diseases are similar phenotypically, and clinically with different neurodegenerative pathways. Considering the similar neurodegenerative pathways between Parkinson's Disease and Parkinsonism, it is not surprising that color vision tritan defect is present in both sample group. Confirming the literature, the presence of the protan color vision defect in Parkinson's Disease contrasts with the normal aging. No presence of the tritan defect in the early Parkinson's Disease is probably due to the short duration of the disease, without Any treatment, too. The different neurodegenerative pathway in Essential Tremor, the olive-cerebellar-rubral-thalamic loop does not influence the color vision, evidently

REFERENCES

Piro A., Tagarelli A., Nicoletti G., et al. Color vision impairment in Parkinson's disease. JPD; 2014, 4: 317-319; Nicoletti G., Manners D., Phil D. Et al. Diffusion tensor MRI changes in cerebellar structures of patients with familial essential tremor. Neurology; 2010, 74: 988-994; Zeki S. A vision of the brain. Oxford: Blackwell Scientific Publications; 1993