

## CASE REPORT

# Ozone Treatment in Retinitis Pigmentosa: Effect on Color Perception and Blood Gasses

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It is well-established that retinitis pigmentosa is a hereditary disorder characterized by progressive loss of visual field and visual difficulty in low light situations. Patients with this disorder generally experience a progressive and relentless constriction of the visual fields resulting in eventual inability to drive, often altering career aspirations and ultimately requiring assistance in navigation in unfamiliar areas.<sup>1</sup> Research continues to try to discover a cure for retinitis pigmentosa. To date, this has been unsuccessful. All treatment attempts for retinitis pigmentosa have also been unsuccessful. Most recently, however, studies indicate that Vitamin A palmitate over a long period of time can decrease the progression of retinitis pigmentosa and allow visual function to be maintained for at least a slightly longer extended period of time than would be expected if this medication was not used.<sup>2</sup>

An announcement was issued by the Clinica Internacional de Retinosis Pigmentaria in Havana, Cuba, that a treatment program for retinitis pigmentosa was being administered and that patients receiving this treatment were demonstrating improvement in their visual function.<sup>3</sup> Dr. Orfilio Pelaez Molino, director of this well-equipped facility is convinced that this procedure is able to allow retinitis pigmentosa patients to function more effectively. Patients from all over the world heard of this regimen and traveled to Cuba for treatment. A number of U.S. patients traveled clandestinely for this treatment as well.

After a trip to Cuba to examine patients, review records, and observe the therapeutic course of treatment, we noted improvement in various areas of visual function. In addition, the patients described their ability to see colors more vibrantly, and related that they were able to distinguish shades and more detailed patterns in colored fabrics and surroundings more easily. These increased visual capabilities seemed to provide hope for those patients seeking some assistance in combating the effects of retinitis pigmentosa.<sup>4</sup>

Some patients who had traveled to Cuba were examined by American ophthalmologists following their return to the United States. The standard testing of visual fields and electroretinogram studies were performed and indicated no significant improvement in either of these two diagnostic tests.<sup>5,6</sup>

Because one of the prominent features described by patients who experienced some visual changes following ozone therapy included the more vivid perception of colors and details in the surrounding environment, it was believed that a scientific examination and testing of this area may be able to document improvement. Two areas were chosen for observation to see if

improvement occurred, one being the possibility of an improvement in blood oxygenation and the other a possible improvement in color perception.

A 38-year-old white woman presented to Marmer Medical Eye Center on June 24, 1997, with symptoms of bilateral constricted visual fields, which were causing her to have difficulty in navigating even in familiar surroundings. She also noted significant limitations in low light situations.

A Yanco Ozone Generator (model #GE60/FM500) was used to generate ozone. The ozone was collected in four 50-cc glass syringes at a concentration of 50 µg/ml O<sub>2</sub>. Two hundred cc of blood was drawn into a sterile collection bottle and the 200 cc of ozone was mixed with the blood, which was then reinfused into the patient. This procedure took approximately 30 minutes and was performed on a schedule of 1 application per day for 15 consecutive days.

Prior to administration of ozone, the patient was taken to South Fulton Medical Center where blood gasses were drawn and analyzed. Also prior to ozone administration, a Farnsworth 100 hue color perception test was conducted at Marmer Medical Eye Center. Following completion of the full 15-application treatment program, the patient presented to South Fulton Medical Center once again, where blood gasses were repeated and analyzed. Also following the full ozone administration program, the Farnsworth 100 hue color perception test was also repeated.

%		O <sub>2</sub>		O <sub>2</sub> Hb/										MECH PT MECH SPONT											
DATE	TIME	FLOW	CODE	pH	PCO <sub>2</sub>	PO <sub>2</sub>	HCO <sub>3</sub>	BE	HGB	O <sub>2</sub> SAT	COHb	METHb	AaDO <sub>2</sub>	MODE	RATE	RATE	VT	VT	PEEP	PS	PIP	MAP	T <sub>1</sub>	I	
07/10/97	07:19	21%	RA	7.41	40	108	25	0.7	13.9	98	0.4	0.3	-11		0	0	0								
06/25/97	16:44	21%	RA	7.41	37	92	23	-1.2	14.0	97	0.4	0.2	9		U	U	U								

Fig 1.—Results of blood gas testing in 38-year-old patient before and after ozone therapy.

Prior to ozone application, the PO<sub>2</sub> blood gas was recorded at 92. Following completion of the ozone therapy, the blood gas PO<sub>2</sub>, measured 108 (Fig 1). Prior to the administration of ozone, the number of errors the patient recorded on the Farnsworth 100 hue color perception test measured 236 (Fig 2). Following the ozone administration, the number of errors recorded using the Farnsworth color perception test was only 148 (Fig 3).

The patient had no history of chronic obstructive lung disease and had no other exposure to cause an increase in her oxygen supply. She had exposure only to ambient air, yet her blood gas level showed significant improvement in the PO<sub>2</sub> levels following ozone administration. This may infer that more study is necessary in the belief that ozone is so unstable that it breaks down before blood can be transfused back into a patient.

The accuracy rate in completing the Farnsworth 100 hue color perception test was also significant. The accuracy of alignment of the small test tiles improved from an error rate of 236 to only 148.

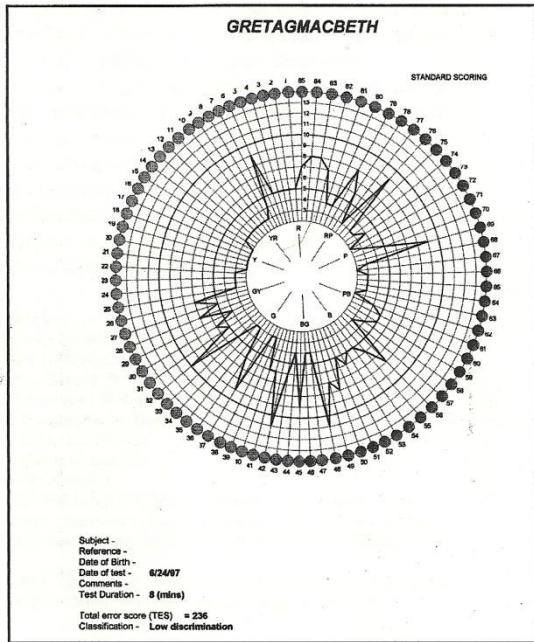


Fig 2.—Results of Farnsworth 100 hue color perception test before ozone therapy, showing 236 errors.

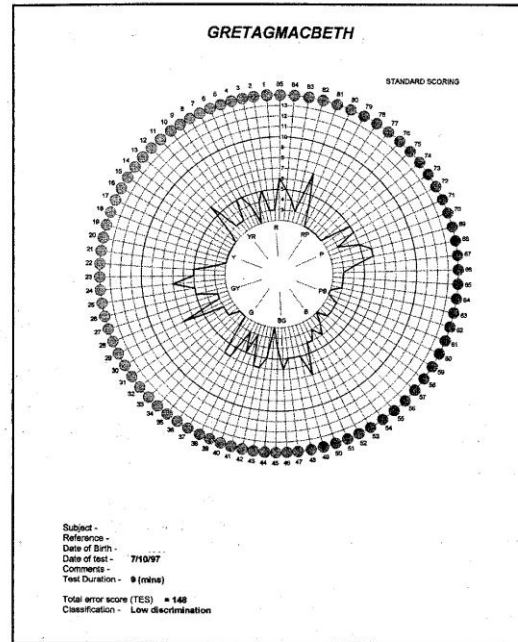


Fig 3.—Results of Farnsworth 100 hue color perception test after ozone therapy, showing only 148 errors.

## Conclusion

Administration of ozone appears to improve the quality and clarity of color perception. The ability to perceive more subtle changes in colors including all aspects of the visual environment appears to be enhanced following ozone therapy. One of the possible explanations for this could be related to the changes noted in the  $PO_2$  levels following the studies of the patient's blood gasses before and after ozone administration.

The duration of these effects has not been established. However, the clinical impression based on patient description is that these effects appear to last at least several months. Therefore, periodic administration of ozone intravenously to attempt to maintain these beneficial effects on retinitis pigmentosa patients' visual capabilities may be indicated.

Although it is recognized that a larger sample of patients is necessary to provide more conclusive results, this case report does appear to indicate some degree of encouragement. It may be possible at least to provide patients with some enhancement in their visual capabilities and allow them to perform daily activities more comfortably and securely until a true cure for this disease is available.

## References

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