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Type A behavior pattern: is it a risk factor for open-angle glaucoma?

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Type A behavior pattern

Personality type =
what you are

Behavior pattern type =
what you do

Type A behavior pattern

'I was made this way'

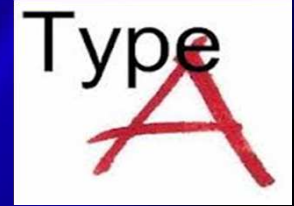
Behavior pattern type =
what you do

Type A behavior pattern

'I was made this way'

'I learnt to be this way'

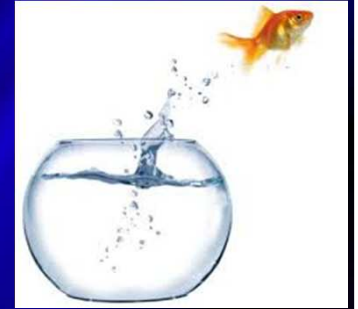
Type A behavior pattern



Friedman and Rosenman (1959):

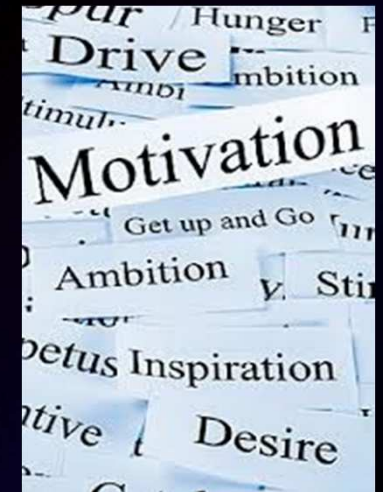
- description of Pattern A behavior
- based on previous research and clinical experience with patients.
- expected to be associated with high levels of blood cholesterol and hence coronary heart disease.

Type A behavior pattern



- A summary of **Pattern A behavior** is given below:

1. an intense, sustained drive to achieve personal (and often poorly defined) goals
2. a profound tendency and eagerness to compete in all situations
3. a persistent desire for recognition and advancement



Type A behavior pattern

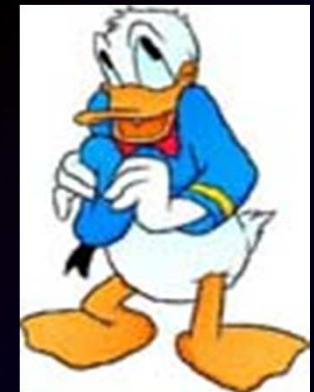
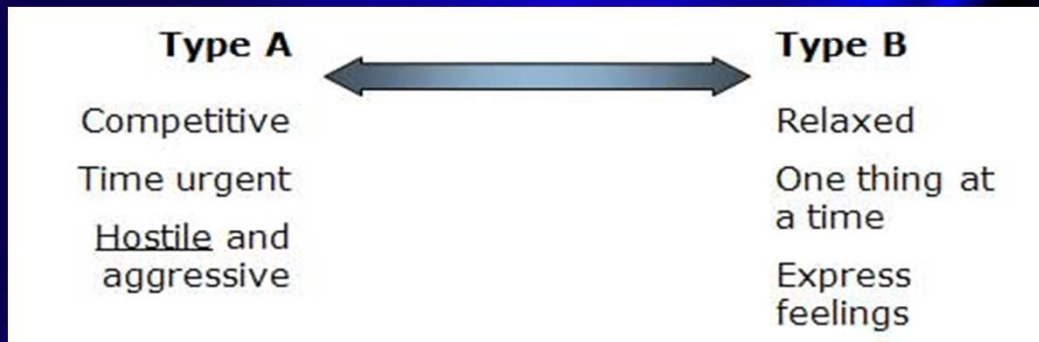


- A summary of **Pattern A behavior** is given below:
 4. continuous involvement in several activities at the same time that are constantly subject to deadlines
 5. an habitual tendency to rush to finish activities
 6. extraordinary mental and physical alertness.



Type B behavior pattern

Relative absence of drive, ambition, urgency, desire to compete, or involvement in deadlines.



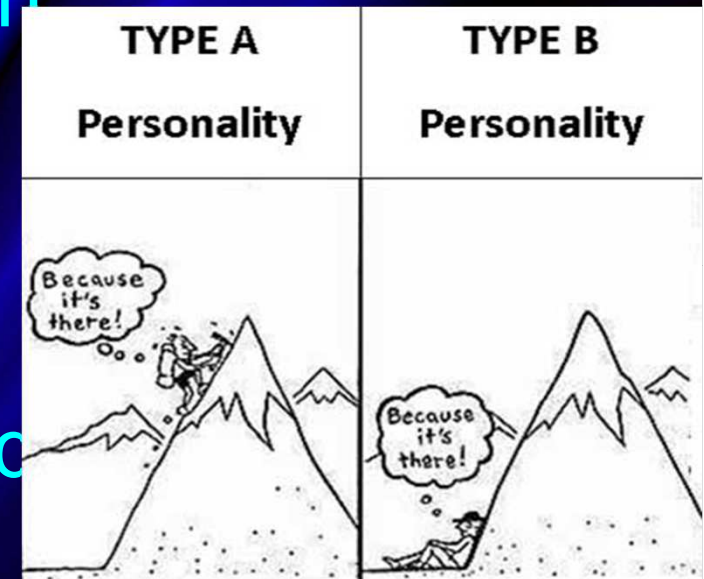
Type A vs. Type B

☀ *Type A Behavior Pattern:*

A pattern of behavior involving high levels of competitiveness, time urgency, and irritability.

☀ *Type B Behavior Pattern:*

A pattern of behavior characterized by a casual, laid-back style; the opposite of the Type A behavior pattern.



Research in Type A behavior

- Twelve-year longitudinal study of over 3,500 healthy middle-aged men (*Friedman and Rosenman, 1974*).
- Compared to people with the Type B, people with the Type A behaviour pattern were twice as likely to develop coronary heart disease.



Type A and Cardiovascular Disease

Type A Behavior

- Early research found a relationship between Type A and risk for heart attack
- Later research couldn't replicate -why?
- What part of Type A is most lethal?



Type A and Cardiovascular Disease

Type A Behavior



- A syndrome of several traits:
 - Achievement motivation and competitiveness
 - Time urgency
 - Association with anxiety ¹
 - Hostility and aggressiveness

¹ Int J Psychiatry Med. 1986-1987;16(2):123-9. Lee MA, Cameron OG.

Int J Prev Med. 2013 May; 4(Suppl 2): S279–S283.

Vahid Shaygannejad, Sedigheh Rezaei Dehnavi,¹ Fereshteh Ashtari, Somayeh Karimi,¹ Leila Dehghani,² Rokhsareh Meamar,² and Zahra Tolou-Ghamari²

Type A and Cardiovascular Disease

Hostility

Is it the specific trait of Hostility, rather than the general syndrome of Type A, that is a better predictor of heart disease?

Type A and Cardiovascular Disease

Hostility

- The “toxic-core”
- Most significant feature for risk of heart disease and mortality
- Explosive reaction to stress
- Some theorists distinguish from “Type A” and call “Type H” (controversial)
- More noncompliant with medical advice

Type A and Cardiovascular Disease

How Are the Arteries Damaged by Hostility?

- Flight or fight increases blood pressure
- More blood going through small arteries
- Arteriosclerosis



Controversy about Type A behavior

- The lasting appeal of the Type A behavior pattern is its simplicity and plausibility.
- The interaction of stress with physiological, psychological, social and cultural factors cannot be reduced to two simple behavior patterns.
- Recent reviews of Type A behavior: not useful for predicting whether someone will have a heart attack or not.

Controversy about Type A behavior

- Type A and hostility weakly associated with coronary heart disease, as to make them no use for prevention or prediction (*Myrtek et al., 2001*)
- Tobacco industry helped generate the scientific controversy on TABP, contributing to the enduring popularity and prejudice for Type A personality although scientifically disproven (*Petticrew et al., 2012*)
- On the other side, TAPB are prone to smoking and drinking

Type A behavior pattern and POAG

- Generally, stress is considered of little importance as a risk factor for POAG onset or worsening
- Some studies have reported an increase in IOP during conditions of physical or mental stress, both in healthy and in POAG subjects.

Kaluza G, Stempel I, Maurer H, et al. Stress reactivity of intraocular pressure after relaxation training in open-angle glaucoma patients. *J Behav Med.* 1996;19:587–598.

Kaluza G, Stempel L. Effects of self-relaxation methods and visual imagery on IOP in patients with open-angle glaucoma. *Ophthalmologica.* 1995;209:122–128.

Erb C, Thiel HJ, Flammer J, et al. The psychology of the glaucoma patient. *Curr Opin Ophthalmol.* 1998;9:65–70.

Recupero SM, Contestabile MT, Taverniti L, et al. Open-angle glaucoma: variations in the intraocular pressure after visual field examination. *Glaucoma.* 2003;12:114–118.

Dane S, Koceri I, Denirel H, et al. Effect of acute submaximal exercise on intraocular pressure in athletes and sedentary subjects. *Int J Neurosci.* 2006;116:1223–1230.

The psychology of the glaucoma patient.

Erb C, Thiel HJ, Flammer J.

Author information

Abstract

Under physiological conditions, intraocular pressure (IOP) is controlled by the autonomic and central nervous systems. Correspondingly, nerve fibers and neurotransmitters are present in ciliary body and trabecular meshwork. IOP responds to physical as well as psychological stimuli in healthy individuals. In patients with dysregulated IOP, e.g., in those with primary open-angle glaucoma, emotional instability without a specific personality pattern could be found. Whereas the statistical association between emotional changes and glaucoma is obvious, the causal relationship remains to be clarified. It is at least plausible that psychic stress may have an influence on IOP. However, the sequence of the events is unknown (emotional disturbance can be the result of the disease or it can be a primary sign of a nervous dysfunction). Therefore, it seems meaningful—in addition to standard glaucoma therapy—to try to improve the patient's emotional condition, both for treatment of the glaucoma and for the patient's general quality of life.

High prevalence of anxiety and depression in patients with primary open-angle glaucoma.

Mabuchi F, Yoshimura K, Kashiwagi K, Shioe K, Yamagata Z, Kanba S, Iijima H, Tsukahara S.

Author information

Abstract

PURPOSE: To assess anxiety and depression in patients with primary open-angle glaucoma (POAG).

DESIGN: Multicenter prospective case-control study.

PARTICIPANTS: Two hundred thirty patients with POAG and 230 sex-matched and age-matched reference subjects with no chronic ocular conditions except cataracts.

INTERVENTION: Anxiety and depression were evaluated using Hospital Anxiety and Depression Scale (HADS) questionnaire, which consists of 2 subscales with ranges of 0 to 21, representing anxiety (HADS-A) and depression (HADS-D).

MAIN OUTCOME MEASURE: The prevalence of POAG patients with anxiety (a score of more than 10 on the HADS-A) or depression (a score of more than 10 on the HADS-D) was compared with that in the reference subjects. The prevalence of patients with depression was compared between the POAG patients with and without current beta-blocker eye drops.

RESULTS: The prevalence (13.0%) of POAG patients with anxiety was significantly higher ($P=0.030$) than in the reference subjects (7.0%). The prevalence (10.9%) of POAG patients with depression was significantly higher ($P=0.026$) than in the reference subjects (5.2%). Between the POAG patients with and without beta-blocker eye-drops, no significant difference ($P=0.93$) in the prevalence of depression was noted.

CONCLUSIONS: POAG was related to anxiety and depression. No significant relationship between the use of beta-blocker eye-drops and depression was noted.

Vascular risk factors for primary open angle glaucoma: the Egna-Neumarkt Study.

Bonomi L, Marchini G, Marraffa M, Bernardi P, Morbio R, Varotto A.

Author information

Abstract

OBJECTIVE: To assess the impact of vascular risk factors on the prevalence of primary open angle glaucoma.

DESIGN: Population-based cross-sectional study.

PARTICIPANTS: Four thousand two hundred ninety-seven patients more than 40 years of age underwent a complete ocular examination in the context of the Egna-Neumarkt Glaucoma Study.

INTERVENTION: Ocular examinations were performed by trained, quality-controlled ophthalmologists according to a predefined standardized protocol including medical interview, blood pressure reading, applanation tonometry, computerized perimetry, and optic nerve head examination.

MAIN OUTCOME MEASURES: Prevalences of ocular hypertension, primary open-angle glaucoma, normal-tension glaucoma, and other types of glaucoma were determined. Correlation coefficients were calculated for the association between systemic blood pressure and age-adjusted intraocular pressure (IOP) and between age and both intraocular and systemic blood pressures. Odds ratios were computed to assess the risk of primary open-angle glaucoma and normal-tension glaucoma in relation to systemic hypertension or antihypertensive medication, blood pressure levels, diastolic perfusion pressure, and a number of other cardiovascular risk factors.

RESULTS: A positive correlation was found between systemic blood pressure and IOP, and an association was found between diagnosis of primary open-angle glaucoma and systemic hypertension. Lower diastolic perfusion pressure is associated with a marked, progressive increase in the frequency of hypertensive glaucoma. No relationship was found between systemic diseases of vascular origin and glaucoma.

CONCLUSIONS: Our data are in line with those reported in other recent epidemiologic studies and show that reduced diastolic perfusion pressure is an important risk factor for primary open-angle glaucoma.

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Type A behavior pattern and POAG

As in cases of ischemic heart disease, stress in patients with POAG may lead to a greater and more prolonged increase in IOP, especially in type A subjects, and a further stimulus of the process of disease development notwithstanding all attempts at treatment.

Type A Behavior Pattern: Is It a Risk Factor for Open-Angle Chronic Glaucoma?

*Raffaella Morreale Bubella, MD, PhD, Daniele Morreale Bubella, MD, PhD,
and Salvatore Cillino, MD, PhD*

Aim:

To evaluate the presence of TABP in POAG patients and the possible role of psychophysiological stress as a risk factor for POAG.

Methods

- 50 POAG patients, 30 women and 20 men
- All cases visited in our glaucoma center within the space of 3 months
- No significant differences in disease duration



Methods

- Mean age 63.42 ± 12.9 years. No differences between the sexes.
- All treated with β -blockers and/or prostaglandins and/or carbonic anhydrase inhibitors.

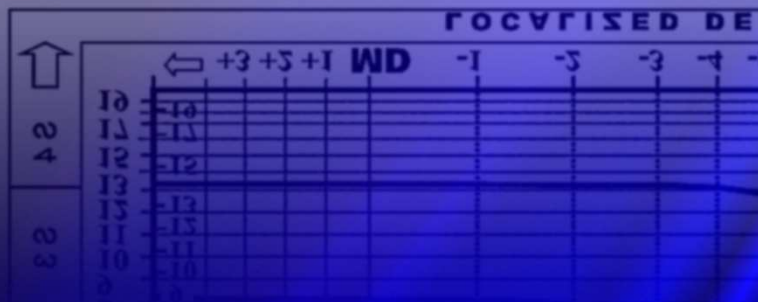
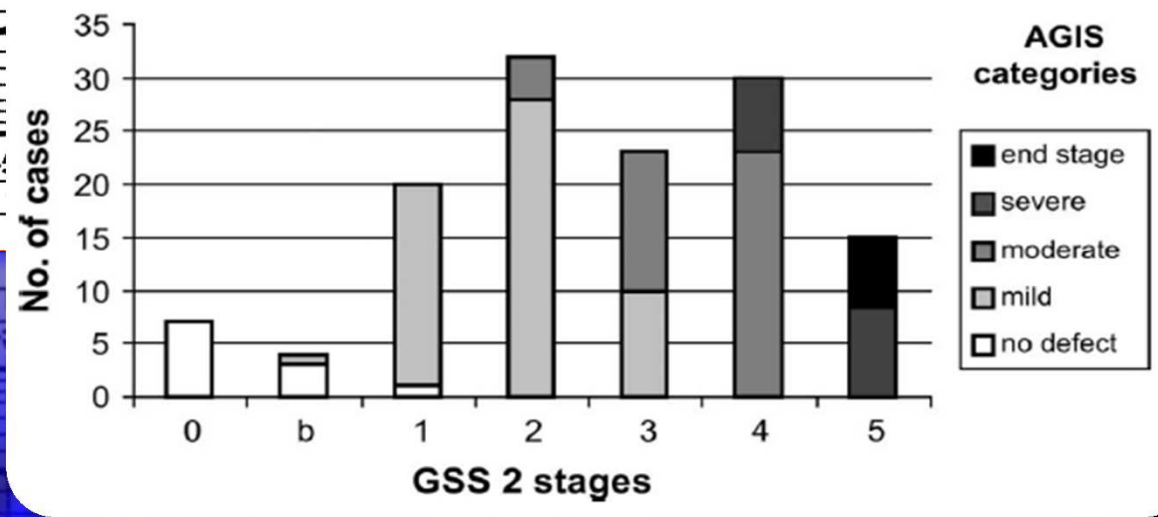
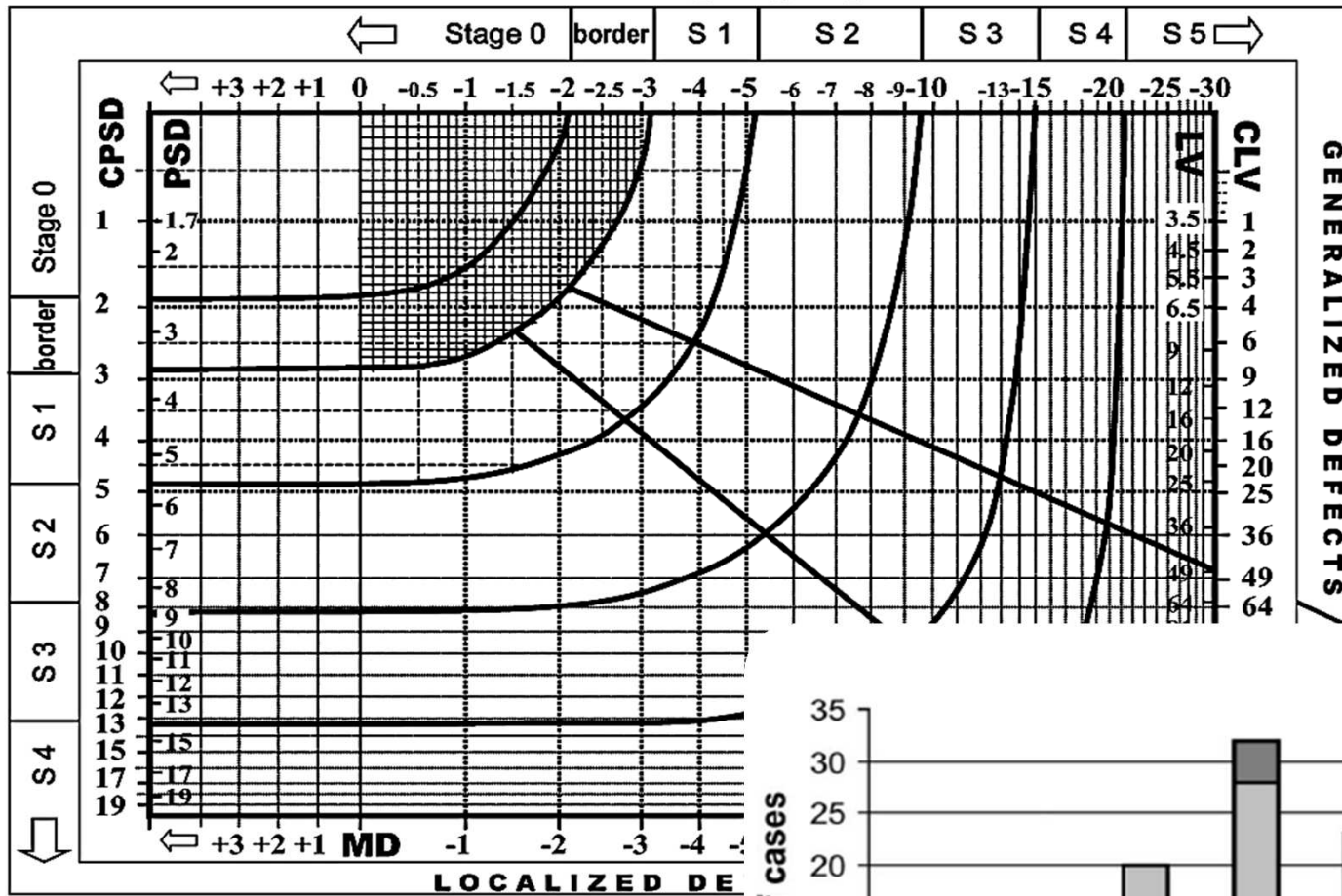


Methods

- Complete biomicroscopic examination.
- Tonometry and daily tonometric curve
- Visual field by “Octopus 1-2-3”
- Glaucoma Staging System 2 (GSS2)
- Monitoring of the retinal nerve fiber layer with GDx VCC



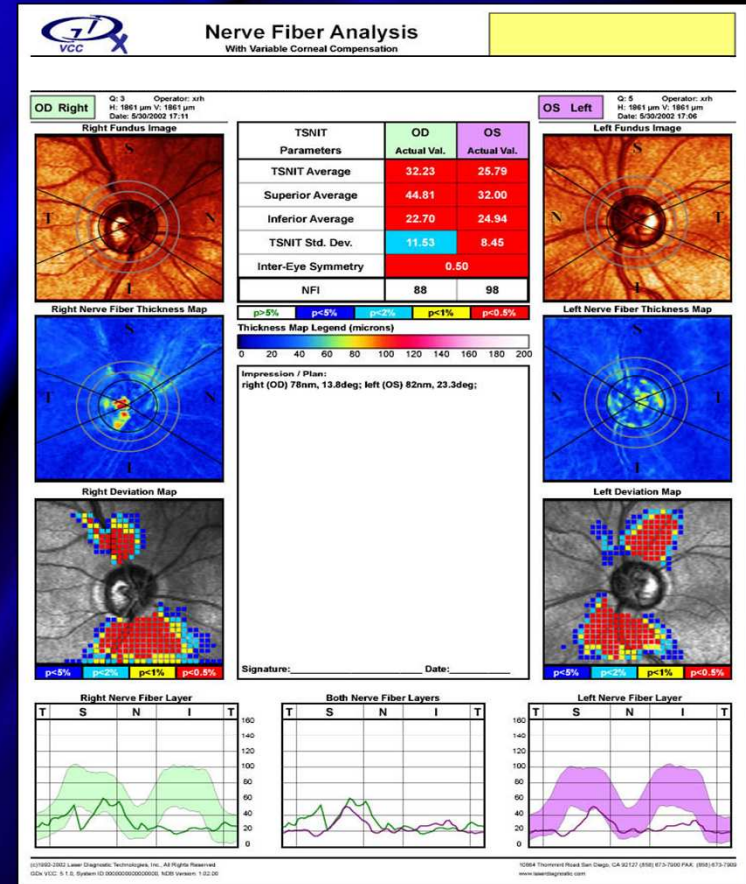
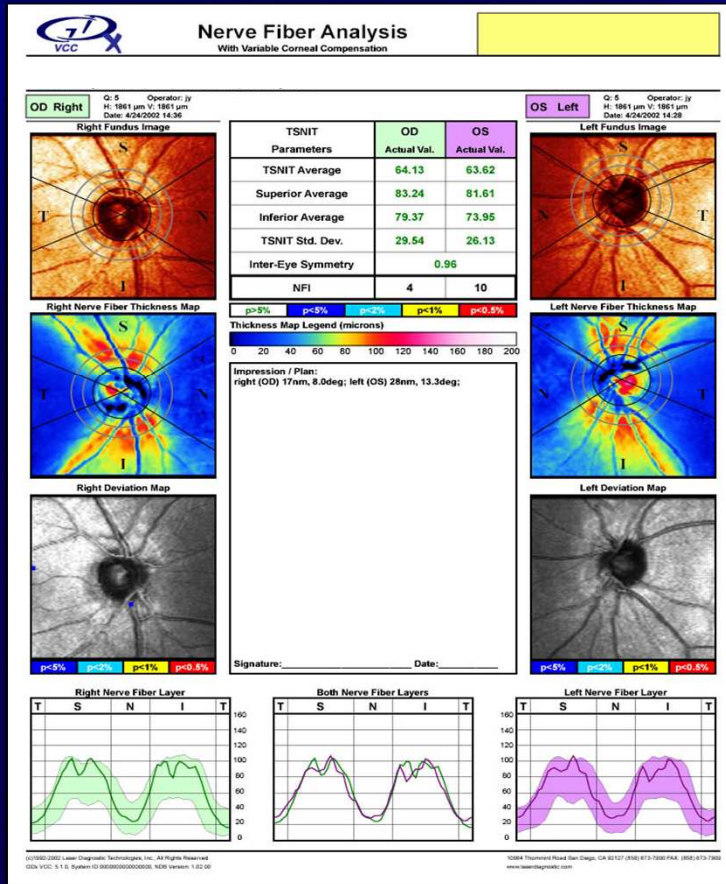
Glaucoma Staging System 2



TSNIT Graph

Healthy

Glaucoma



TSNIT Graph



Nerve Fiber Indicator (NFI)

- Measures both focal and diffuse Retinal Nerve Fiber Layer loss
- Advanced form of a neural network, trained to discriminate normal from glaucoma
- The most sensitive parameter for discriminating normal from glaucoma ¹

Normal		Borderline		Abnormal	
1	30	31	50	51	100

TSNIT Parameters	OD Actual Val.	OS Actual Val.
TSNIT Average	48.08	33.27
Superior Average	54.39	46.23
Inferior Average	62.33	28.06
TSNIT Std. Dev.	22.36	14.83
Inter-Eye Symmetry	0.50	
NFI	25	63

p>5%
p<5%
p<2%
p<1%
p<0.5%

¹ Medeiros, Zangwill, Bowd, Mohammadi and Weinreb, *ISIE* May 2-3, 2003

Methods

Psychological tests performed, validated, and administered by the same psychologist

- **Type A/B personality questionnaire** (version modified by the Jenkins Activity Survey)
- **Ercta-B test** for further personality evaluation of type A subjects.
- **Hamilton Anxiety Rating Scale** to assess the presence of anxiety and its level.
- **Test of psychic distress: IGD questionnaire** to assess the level of this and of the psychopathologic symptoms together with levels of self-esteem, extroversion, and the distress level.
- **State-Trait Anxiety Inventory test (STAI test).**
- **Brief-cope test.**
- **Life event.**

The authors thank L. Ferraro (Section of Psychology, Department of Experimental Biomedicine and Clinical neuroscience, University of Palermo, Palermo, Italy) for psychological evaluation of patients in this study.

Hamilton Anxiety Rating Scale (HAM-A)

Below is a list of phrases that describe certain feeling that people have. Rate the patients by finding the answer which best describes the extent to which he/she has these conditions. Select one of the five responses for each of the fourteen questions.

0 = Not present, 1 = Mild, 2 = Moderate, 3 = Severe, 4 = Very severe.

1 Anxious mood 0 1 2 3 4

Worries, anticipation of the worst, fearful anticipation, irritability.

2 Tension 0 1 2 3 4

Feelings of tension, fatigability, startle response, moved to tears easily, trembling, feelings of restlessness, inability to relax.

3 Fears 0 1 2 3 4

Of dark, of strangers, of being left alone, of animals, of traffic, of crowds.

4 Insomnia 0 1 2 3 4

Difficulty in falling asleep, broken sleep, unsatisfying sleep and fatigue on waking, dreams, nightmares, night terrors.

5 Intellectual 0 1 2 3 4

Difficulty in concentration, poor memory.

6 Depressed mood 0 1 2 3 4

Loss of interest, lack of pleasure in hobbies, depression, early waking, diurnal swing.

7 Somatic (muscular) 0 1 2 3 4

Pains and aches, twitching, stiffness, myoclonic jerks, grinding of teeth, unsteady voice, increased muscular tone.

8 Somatic (sensory) 0 1 2 3 4

Tinnitus, blurring of vision, hot and cold flushes, feelings of weakness, pricking sensation.

9 Cardiovascular symptoms 0 1 2 3 4

Tachycardia, palpitations, pain in chest, throbbing of vessels, fainting feelings, missing beat.

10 Respiratory symptoms 0 1 2 3 4

Pressure or constriction in chest, choking feelings, sighing, dyspnea.

11 Gastrointestinal symptoms 0 1 2 3 4

Difficulty in swallowing, wind abdominal pain, burning sensations, abdominal fullness, nausea, vomiting, borborygmi, looseness of bowels, loss of weight, constipation.

12 Genitourinary symptoms 0 1 2 3 4

Frequency of micturition, urgency of micturition, amenorrhea, menorrhagia, development of frigidity, premature ejaculation, loss of libido, impotence.

13 Autonomic symptoms 0 1 2 3 4

Dry mouth, flushing, pallor, tendency to sweat, giddiness, tension headache, raising of hair.

14 Behavior at interview 0 1 2 3 4

Fidgeting, restlessness or pacing, tremor of hands, furrowed brow, strained face, sighing or rapid respiration, facial pallor, swallowing, etc.

Brief COPE Questionnaire

Here you can take a brief questionnaire about what coping strategy you use. This survey was created by Dr. Carver of the University of Miami and is used to empirically determine what mechanisms you use and helps you identify what research says about that technique.

This questionnaire concerns how you coped with your most stressful experience identified above. Use the following response choices. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can. Use the following choices:

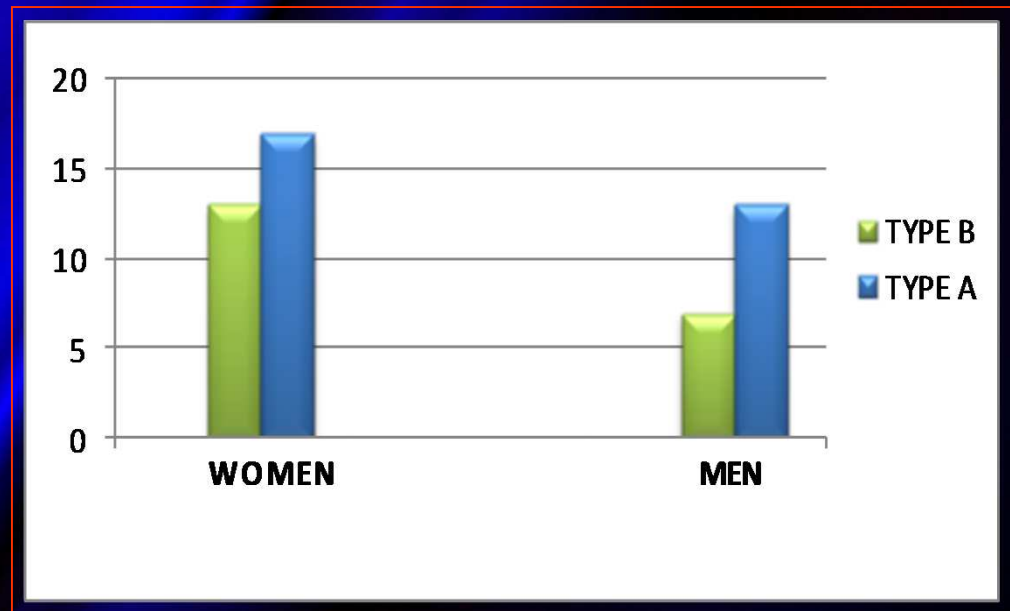
1 = Not at all 2 = A little bit 3 = A medium amount 4 = A lot

- 1. Turned to work or other activities to take my mind off things.
- 2. Concentrated my efforts on doing something about the situation I'm in.
- 3. Said to myself "this isn't real."
- 4. Used alcohol or other drugs to make myself feel better.
- 5. Got emotional support from others.
- 6. Gave up trying to deal with it.
- 7. Took time to figure out what I'm really feeling.
- 8. Took action to try to make the situation better.
- 9. Refused to believe that it has happened.
- 10. Said things to let my unpleasant feelings escape.
- 11. Got help and advice from other people.
- 12. Used alcohol or other drugs to help me get through it.
- 13. Tried to see it in a different light, to make it seem more positive.
- 14. Criticized myself.
- 15. Realized that my feelings are valid and important.
- 16. Tried to come up with a strategy about what to do.
- 17. Got comfort and understanding from someone.
- 18. Gave up the attempt to cope.
- 19. Looked for something good in what was happening.
- 20. Made jokes about it.
- 21. Did something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
- 22. Accepted the reality of the fact that it has happened.
- 23. Allowed myself to express my emotions.
- 24. Expressed my negative feelings.
- 25. Tried to find comfort in my religion or spiritual beliefs.
- 26. Tried to get advice or help from other people about what to do.
- 27. Learned to live with it.
- 28. Thought hard about what steps to take.
- 29. Blamed myself for things that happened.
- 30. Prayed or meditated.
- 31. Let my feelings come out freely.
- 32. Made fun of the situation.



Results

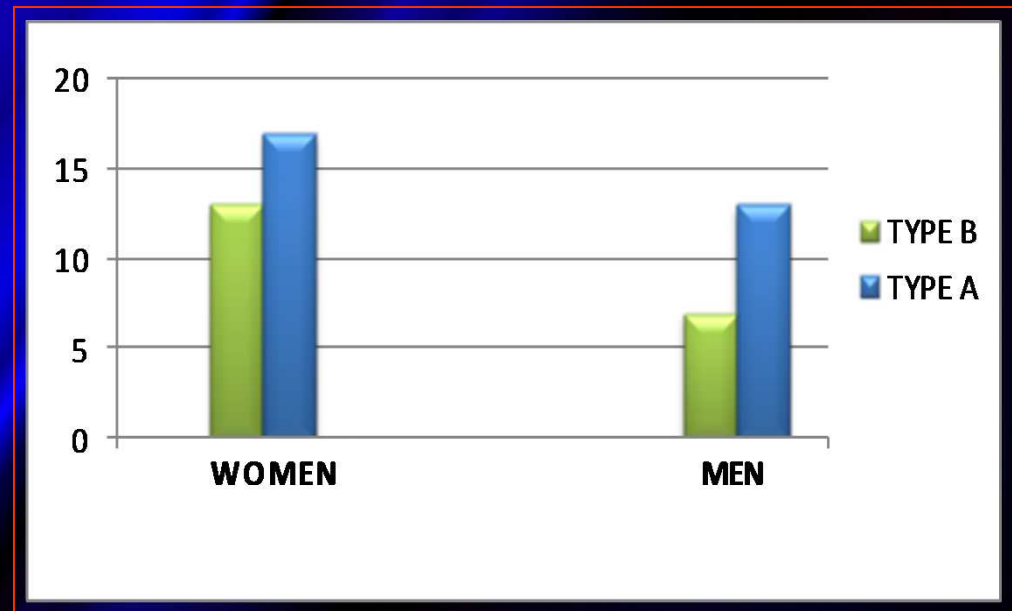
- 64% of the patients, 17 women and 13 men, showed type A behavior.





Results

- In these subjects a higher incidence of poor BP control was found.





Results

Table 2 Prevalence of type A behaviour pattern among patients with hypertension and the controls

Risk factor	Cases		Controls		OR (95% CI)
	No.	%	No.	%	
Type A behaviour	127	57.5	55	24.9	4.08 (2.72–6.11)
Non-type A behaviour	94	42.5	166	75.1	
Total	221	100.0	221	100.0	

$\chi^2 = 48.4, df = 1, P < 0.001$

OR = odds ratio; CI = confidence interval; df = degrees of freedom.

Type A behaviour pattern: is it a risk factor for hypertension?

J.N. Al-Asadi¹

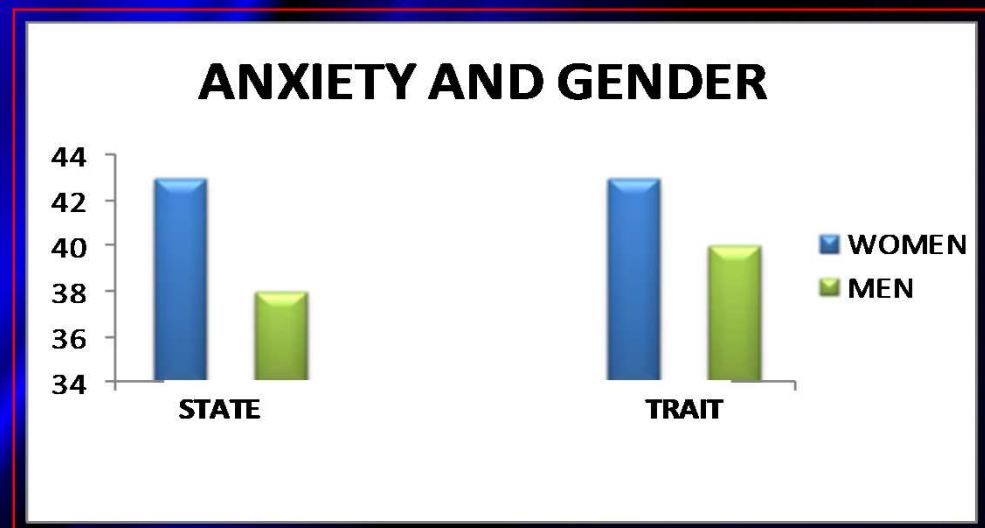




Results



- 50% of the group, 11 women and 4 men, presented a **state anxiety**, which exceeded the cutoff point and was different in the 2 sexes, with higher levels in the women ($p=0.03$).

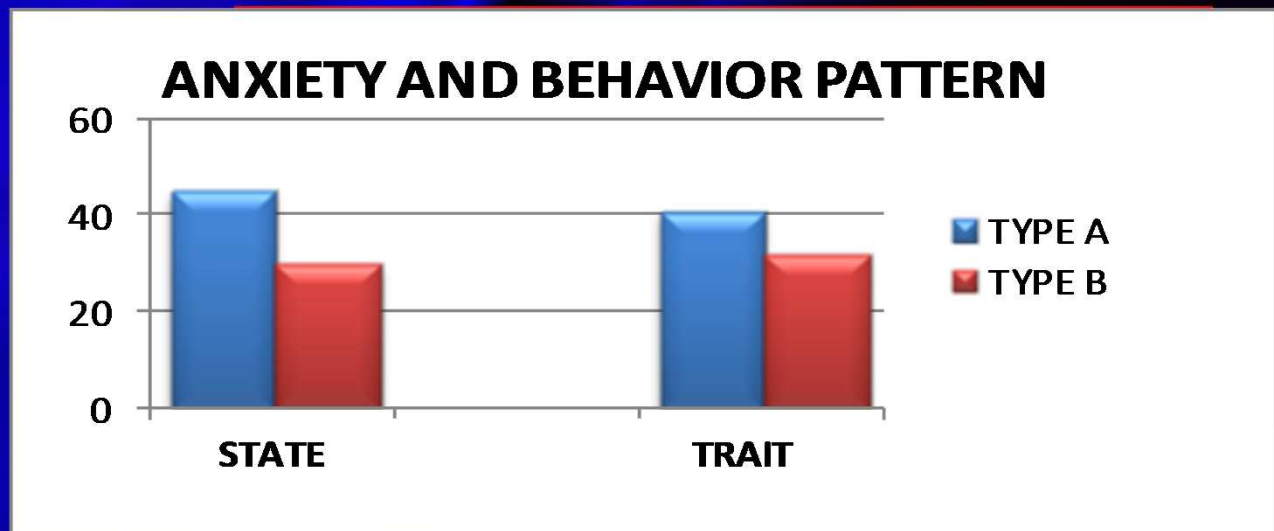




Results



- 54% of the subjects examined also showed a **trait anxiety**, which exceeded the cutoff point.
- Both **trait and state anxiety** more evident in type A subjects (TABP; $p=0.001$.)





Results



- IOP in Type A: 20.2 ± 2.57 mm Hg (range, 16 to 27 mm Hg);
- IOP in Type B: 20.4 ± 1.59 mmHg (range, 18 to 25 mm Hg).

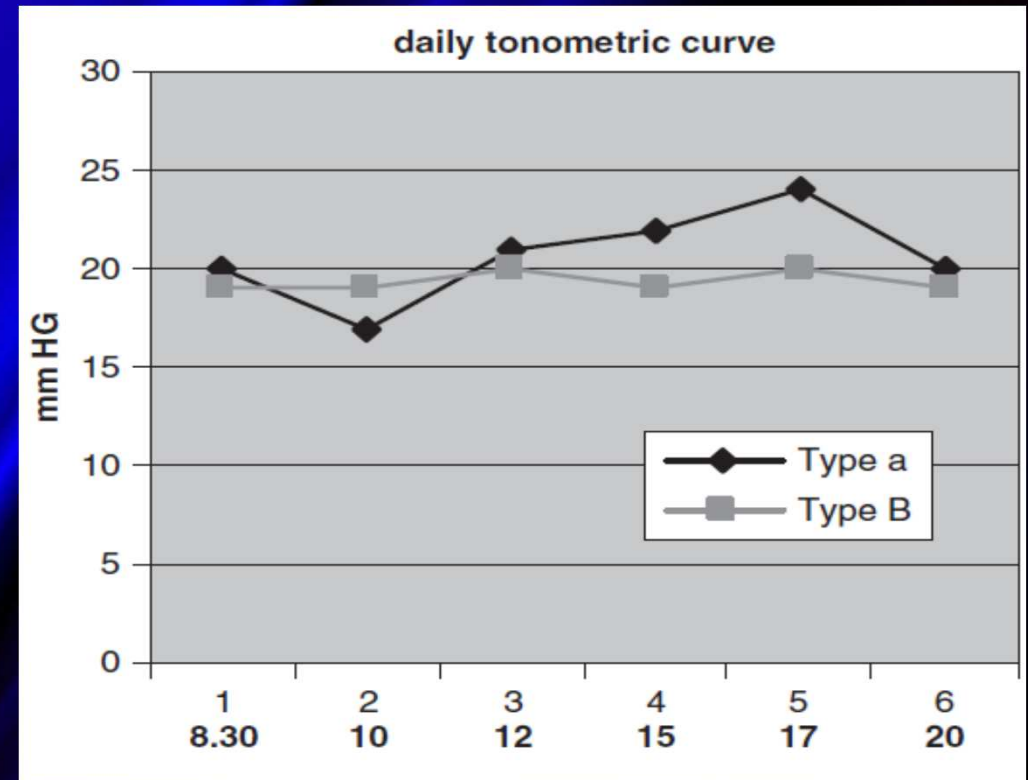




Results



- Daily tonometric curve:
greater fluctuations in subjects with Type A BP

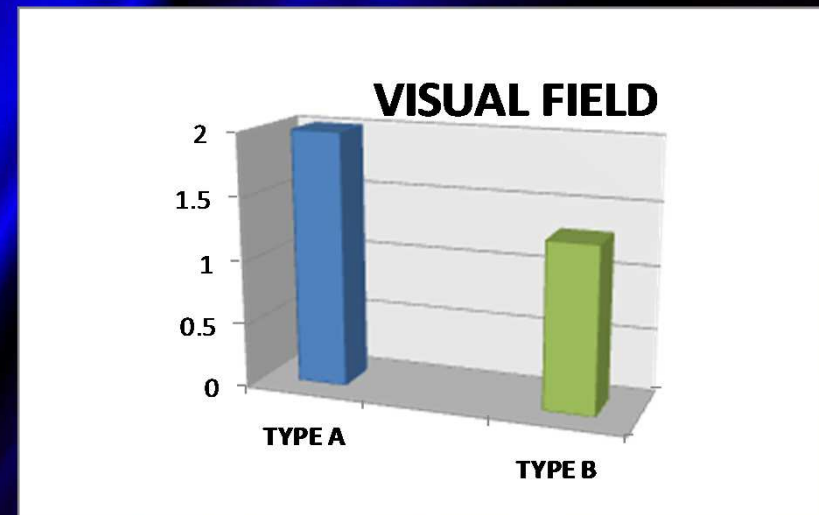




Results



- Visual field showed involvement at GSS2 was more significant ($P=0.001$) in Type A (2.65 ± 0.83) compared with that in Type B subjects (1.55 ± 0.97).

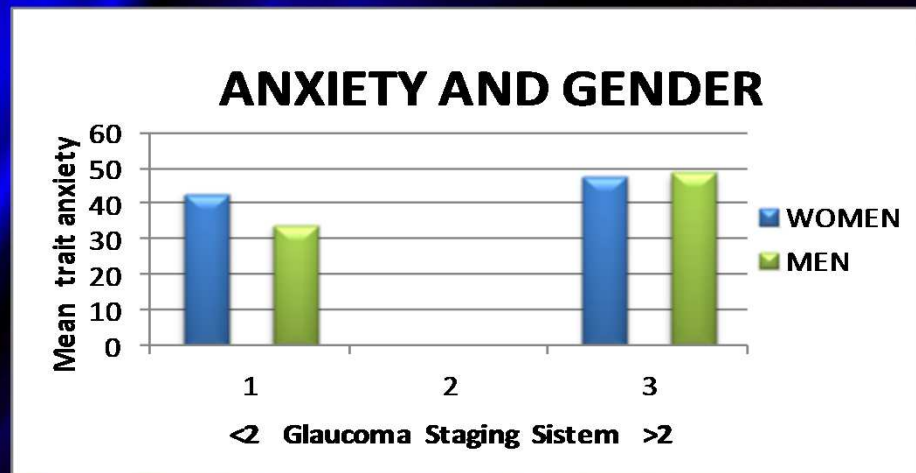




Results



- Subjects with perimetric damage grading at GSS2 of ≥ 2 presented a higher level of **situation anxiety** with no difference between the sexes, whereas this was higher in women, although not significantly, when this damage was < 2 .





Results



- With the Brief-cope scale, visual field involvement showed a significant negative correlation ($P=0.024$).



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Results



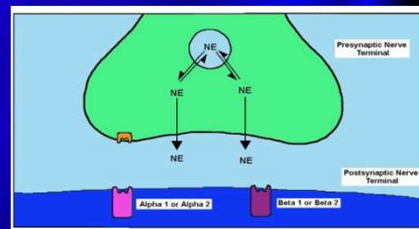
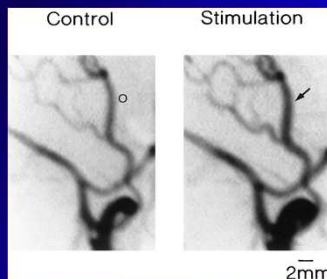
- The TSNIT GDx VCC values higher ($P > 0.001$) in Type B subjects, with a mean value of 59, compared with the 53 score observed in Type A subjects.
- NFI index higher in Type A subjects ($P = 0.01$), with a mean value 40 (range, 34 to 52), compared with the value of 35 (range, 30 to 43) observed in the type B subjects

Discussion

1. Stress → catecholamine secretion → vasoconstriction

2. ↑ Vascular resistance ↑ blood pressure levels

3. Catecholamine receptors in the ophthalmic artery and in the extraocular portion of the central retinal artery



4. “High blood pressure may alter perfusion, thus increasing the peripheral resistance of the small blood vessels, such as those supplying the proximal portion of the optic nerve” (Bonomi et al; 2000).

Discussion

Type A subjects in our study:

- Higher visual field involvement
- Lower TSNIT index
- Higher NFI value
- Several daily tonometric curve fluctuations
- Signs of **trait and state anxiety**
- Higher **trait anxiety** with more IOP oscillations if perimetric damage of ≥ 2

Discussion

Type A subjects in our study:

Concurrence of increase in daily IOP fluctuations and high BP spikes = reduced optic nerve perfusion?

- TABP subjects present a **higher level of perimetric damage**, which proves to be associated with **inappropriate management methods of the stress situation** and **higher levels of anxiety** compared with those observed in type B behavior subjects
- Behavior analysis, hence stress evaluation, could become an useful approach for the prognosis and treatment of POAG



To Be *B* or Not to Be *B*—Is That the Question?

Herbert L. Fred, MD and Ramesh Hariharan, MD

Additional article information

The good doctor, whether general practitioner or specialist, ... studies the patient's personality as well as his disease. ¹

— Sir Hugh Cairns (1896–1952)