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Editorial

What's with the anisocoria?

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The anisocoria is understood as a significant difference in the size of the pupils which tends to be a guiding sign in the neurological exploration, but not always.

Tumors, accidents and brain infections make the top list of anisocoria causes, especially if the difference in size between the pupils is greater than 0.6 mm.

Of course, the asymmetry found such in the response as in the size of the pupils, may indicate a dysfunction of the visual pathway.

The size of the pupil is a result of the neurophysiological balance between the dilator and constrictor muscles of the pupil, both depending on the sympathetic and parasympathetic activity respectively; however, this balance may not be always perfect.

By logical assumption, in the medicine area, we would gain confidence in diagnosing that something is wrong with the patient with anisocoria. Until another concept appeared, something different, something like the "physiological anisocoria"; but what is that?

This is a significant asymmetry between pupils noticeable to the naked eye, but without a neuronal damage that justifies it.

This situation, in which no neuronal damage can justifies the presence of anisocoria, would seem to be the exception, something extraordinary and not the rule, however, the physiological anisocoria is more frequent than doctors usually think of.

Indeed, series show that there is an incidence of 19 to 21% of asymptomatic population with anisocoria. This represents one fifth of humanity and whether it is good or bad, a difference greater than 0.4 mm may confirm that the patient has "anisocoria" [1,2].

Of course, a range greater than 0.4 mm should be seen as something exceptional, even pathological until proving otherwise. However, any asymmetry of this magnitude would indicate problems in the structure or function of the pupil without assuring that its magnitude is related to a pathological event.

When anisocoria is found in mesopic conditions, that is, in conditions of lighting, the most dilated pupil is the anomalous, while in scotopic conditions or in darkness, the opposite happens, the smallest pupil is the pathological one [3,4].

Different methods that vary in accuracy have been used to measure anisocoria, as well as, the use of photographic method, which allowed sensitivity and specificity of up to 82% and 69% respectively, sufficient to differentiate between a physiological anisocoria of 0.4 mm and a pathological one of 0.6 mm.

On the other hand, the automated methods of measurement of anisocoria improved their sensitivity; this way, Suh reports anisocoria of 0.1 to 0.5 mm in the 62.84% of healthy children, against an anisocoria of 1.3 mm or higher in children with Horner Syndrome, presented in the 3.7% of its sample [5]. However, these series that are based on millimeter scale have a low sensitivity and specificity [6].

The automated measurements by means of infrared light used as a routine exploration in neurology [7], not necessarily provide a positive correlation between foundlings and results. Doctors can reach wrong conclusions, affected by conditions such as age, medication used, state of enlightenment, state of alert, mood, accommodation and other variables that should be taken into consideration [8].

Among the causes of neuro-ophthalmologic origin associated with anisocoria, we can found amblyopia and strabismus. The series presented by Dunlop, based on photographs and carried out in mesopic conditions were little representative [9], Wermund., *et al*. found no significant differences in the pupillary response of patients in mesopic conditions [10], while Gallegos-Duarte reported anisocoria in up to 50% of patients with strabismus in scotopic conditions [11].

Due to the discrepancies found to determine where and when the anisocoria is really considered pathological, it is worth thinking about how reliable this clinical sign could be in the neurological exploration.

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