المؤتمر السنوي الدولي للجمعية المصرية
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EGYPTIAN OPHTHALMOLOGICAL SOCIETY
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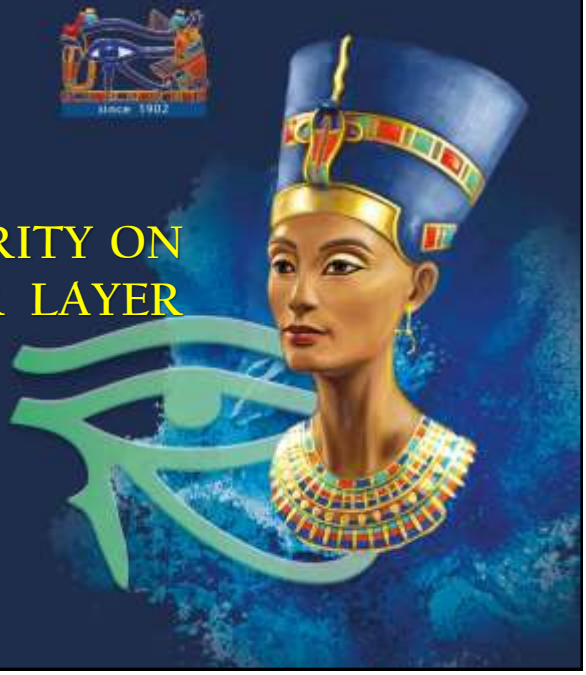
EFFECT OF MIGRAINE SEVERITY ON THE RETINAL NERVE FIBER LAYER THICKNESS

Mohammed Magdy Mohammed Mahmoud
Assistant lecturer at Kafr Elsheikh university



- **Migraine** is a chronic disease characterized by
  - → **Unilateral**
  - → **Throbbing**
  - → **Moderate-to-severe repetitive episodes** of headache
  - → **Vegetative symptoms** such as nausea, vomiting and photophobia.

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➢ Migraine

→ Affects approximately **15%** of the general population.

→ **Most prevalent** neurological disorder.

→ **Third most frequent** global disorder in both genders.

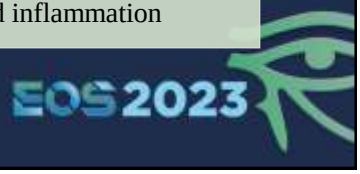
→ Mainly affects **women** aged **20–45** years, and symptoms typically last **4–72 h**.

- According to **The International Classification of Headache Diseases (ICHD),** migraine has two types:
  - ❖ Migraine with Aura (MwA or classic migraine).
  - ❖ Migraine without Aura (MwoA or common migraine).

Criteria of Migraine
Without Aura
A. At least five attacks fulfilling criteria B–D
B. Headache attacks lasting 4-72 h (untreated or unsuccessfully treated)
C. Headache has at least two of the following four characteristics: 1. Unilateral location 2. Pulsating quality 3. Moderate or severe pain intensity 4. Aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs)
D. During headache at least one of the following: 1. Nausea and/or vomiting 2. Photophobia and phonophobia.
E. Not better accounted for by another ICHD-3 diagnosis
With aura
A. At least two attacks fulfilling criteria B and C
B. One or more of the following fully reversible aura symptoms: 1. Visual 2. Sensory 3. Speech and/or language 4. Motor 5. Brain stem 6. Retinal
C. At least two of the following four characteristics: 1. At least one aura symptom spreads gradually over - 5 min, and/or two or more symptoms occur in succession 2. Each individual aura symptom lasts 5-60 min 3. At least one aura symptom is unilateral 4. The aura is accompanied, or followed within 60 min, by headache
D. Not better accounted for by another ICHD-3 diagnosis, and transient ischemic attack has been excluded.

REGARDING THE PATHOPHYSIOLOGY OF MIGRAINE

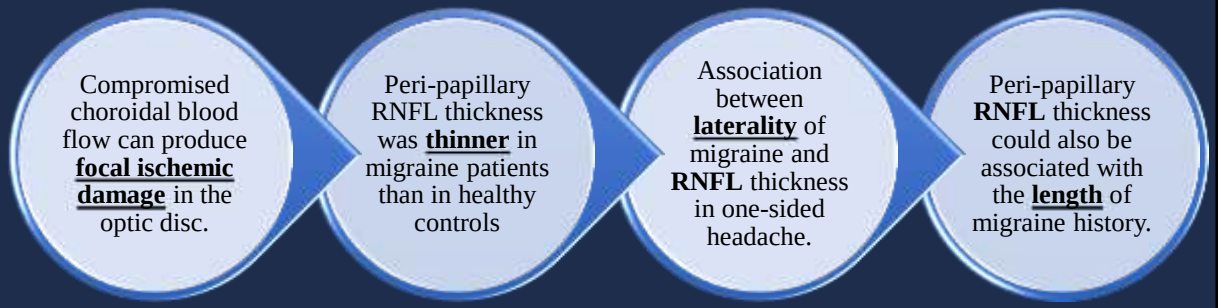
Vascular theory	Neuronal theory	Trigemino-vascular theory
• **Vasoconstriction** occurs during an aura and that subsequent **vasodilatation** causes a headache, has been widely accepted as fact	• Migraine is caused by the **excessive stimulation** of nerve cells in the cerebral cortex.	• Connection between cerebral vessels and the trigeminal nerves with activation of vascular networks results in headache by causing meningeal **vasodilation** and inflammation



- **Retinal migraine** characterized by
  - → **Recurrent**
  - → **Reversible positive or negative monocular visual symptoms**
  - → Thought to be due to **reversible retinal vasospasm.**

- Recent **OCT** studies have revealed that individuals with MwA have **lower** foveal and peri-papillary vascular density as well as **decreased** retinal nerve fiber layer (RNFL) thickness in comparison to healthy controls.

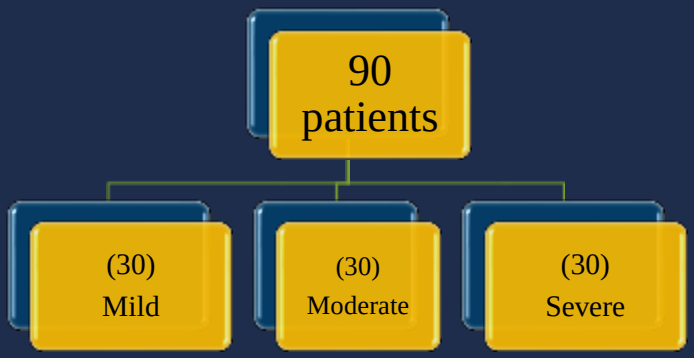
❖ **Optic nerve structural changes in Migraine:**



❖ **Management of migraine:**

- The main objective is to **shorten the frequency** and **duration of migraine attacks** so that it will **reduce the perfusion quality alterations** in optic nerve head microcirculation that contributed to ganglion cell death in migraine patients.

The aim of the study is to evaluate the severity of migraine on ocular perfusion pressure and RNFL thickness.



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Inclusion criteria

- ✓ Patients with criteria of classic migraine.
- ✓ Age from 15-50 years old..

Exclusion criteria

1. Associated systemic diseases: diabetes mellitus and hypertension.
2. History of significant ocular disease: scleritis, uveitis, glaucoma.
3. Ocular trauma, Retinal pathology and Optic nerve anomalies.

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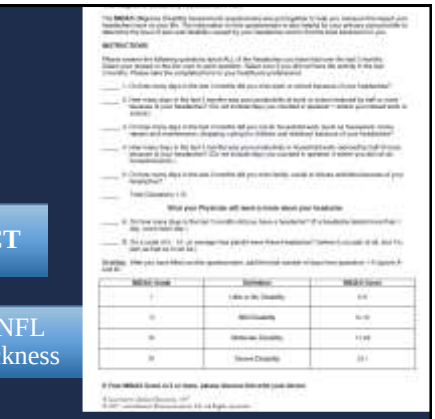
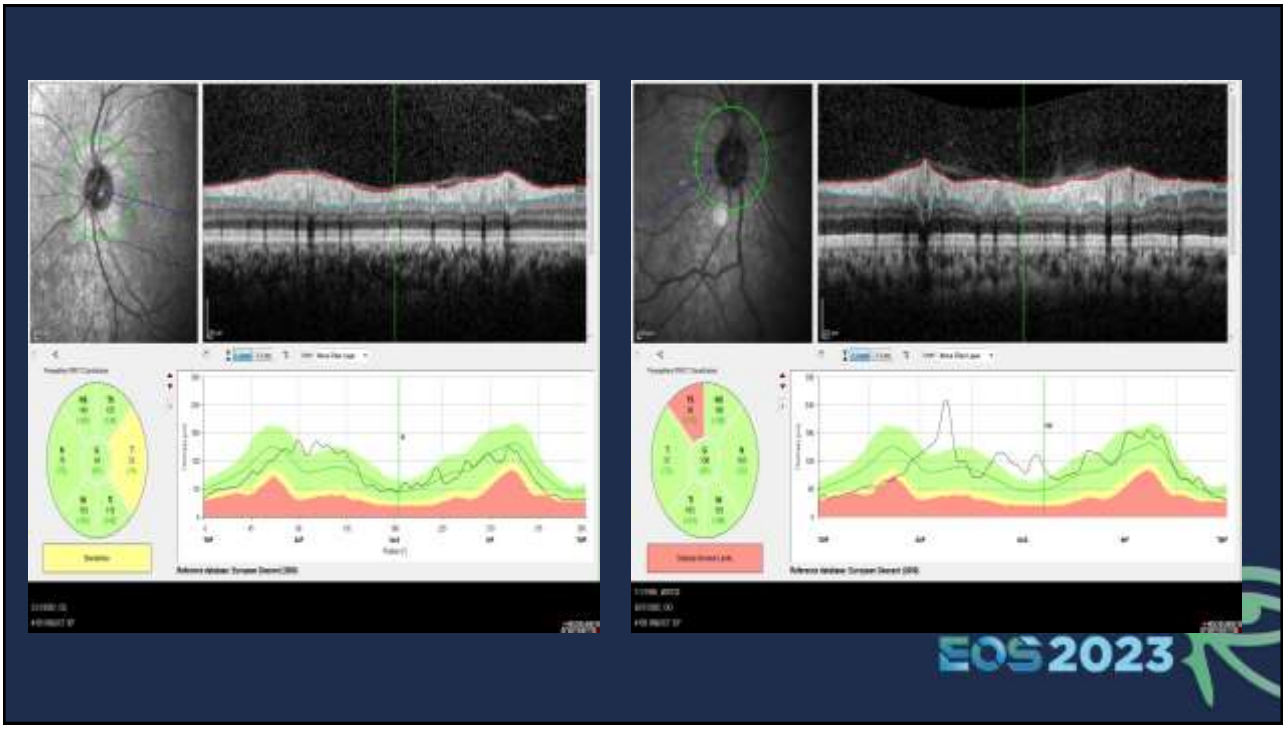
Methods

- **A) History**
  - Personal& Medical hx
  - Duration, Frequency and medications of migraine
- **B) Blood pessure measurement**
- **C) MIDAS**
- **D) Full ophthalmic examination**
  - IOP
  - OPP
    2/3 mean arterial BP-IOP
  - Fundus exam
- **E) OCT**
  - RNFL thickness





- There was statistically **significant decrease** in **average** RNFL thickness, **TI**, **TS** and **T** quadrants with the increase of severity of migraine.

RNFL Thickness		Mild migraine No. = 30	Moderate migraine No. = 30	Severe migraine No. = 30	Test value*	P-value
Average	Mean±SD	104.80 ± 7.79	99.00 ± 4.99	92.57 ± 8.88	20.496	**0.000**
	Range	92.00 - 119.5	91.5 - 108	79.5 - 108		
TI (um)	Mean±SD	117.22 ± 7.94	108.72 ± 10.53	97.40 ± 13.98	24.079	**0.000**
	Range	101.00 - 136.5	87.5 - 135	80 - 138.5		
NI (um)	Mean±SD	117.28 ± 22.82	114.95 ± 18.61	114.52 ± 30.40	0.111	0.895
	Range	78.00 - 183.5	87 - 150.5	69 - 184.5		
TS (um)	Mean±SD	143.92 ± 18.11	135.62 ± 9.36	118.88 ± 15.83	21.965	**0.000**
	Range	112.50 - 183	113 - 155.5	91 - 143.5		
NS (um)	Mean±SD	118.33 ± 18.07	116.82 ± 14.39	115.47 ± 15.96	0.235	0.791
	Range	89.50 - 151.5	92.5 - 145.5	92 - 145		
N (um)	Mean±SD	78.02 ± 14.55	73.07 ± 11.51	70.07 ± 13.04	2.821	0.065
	Range	51.50 - 115	46.5 - 89.5	44 - 98.5		
T (um)	Mean±SD	75.23 ± 7.22	69.03 ± 7.60	61.42 ± 7.19	26.681	**0.000**
	Range	65.00 - 94	60 - 98	51.5 - 73		

- There was **no statistically significant** relation found between **severity** of migraine and **ocular perfusion pressure** of the studied patients.

Ocular perfusion pressure	Mild migraine No. = 30	Moderate migraine No. = 30	Severe migraine No. = 30	Test value	P-value
Mean±SD	47.64 ± 5.49	47.83 ± 6.52	47.69 ± 3.39	0.011	**0.989**
Range	34.66 - 56.88	35.38 - 61.6	40.72 - 51.94		

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- There was **statistically significant negative correlation** found between disease duration and **average** RNFL thickness, **TI**, **TS**, **NS**, **N** and **T** quadrants.
- **No statistically significant** correlation found between disease duration and ocular perfusion pressure.

	Disease duration (year)	
	r	p-value
Ocular perfusion pressure	-0.035	**0.742**
Average	-0.421**	0.000
TI (um)	-0.428**	0.000
NI (um)	-0.127	**0.234**
TS (um)	-0.268*	0.011
NS (um)	-0.232*	0.027
N (um)	-0.298**	0.004
T (um)	-0.385**	0.000

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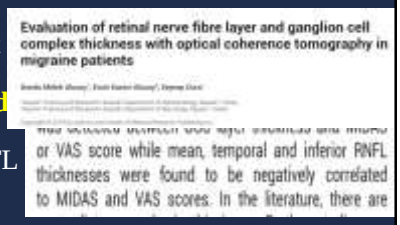
Relation between severity of migraine and RNFL thickness

AGREE

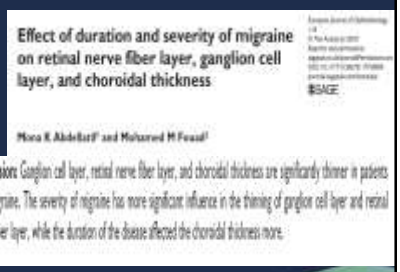
Ulusoy et al. (2019) found that significant **inverse correlation between migraine severity and** thickness of the **inferior** and **temporal** quadrants of the RNFL


Evaluation of retinal nerve fibre layer and ganglion cell complex thickness with optical coherence tomography in migraine patients

or VAS score while mean, temporal and inferior RNFL thicknesses were found to be negatively correlated to MIDAS and VAS scores. In the literature, there are

AGREE

Abdellatif et al. (2018)


Effect of duration and severity of migraine on retinal nerve fiber layer, ganglion cell layer, and choroidal thickness

Mona K Abdellatif and Mohamed M Fouad

Conclusion: Ganglion cell layer, retinal nerve fiber layer, and choroidal thickness are significantly thinner in patients with migraine. The severity of migraine has more significant influence in the thinning of ganglion cell layer and retinal nerve fiber layer, while the duration of the disease affected the choroidal thickness more.

Disagree

Simsek et al. (2014)

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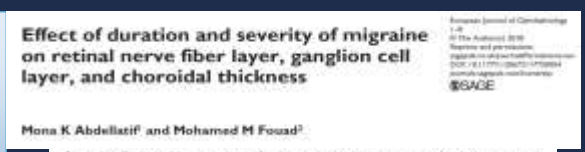
Correlation of disease duration with RNFL thickness

AGREE

Abdellatif et al. (2018) found negative correlation between duration and **superior** and **inferior** quadrants of the RNFL.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Gunes et al. (2016)


Is Retinal Nerve Fiber Layer Thickness Change Related to Headache Lateralization in Migraine?

Feng et al. (2016)

In our study, a significant correlation was found between headache duration and superior RNFL thickness, and attack frequency and temporal RNFL thickness. However,

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Home Message

- Migraine has strong effect on the posterior ocular structures. The **duration** and **severity** of migraine have strong effect on RNFL thickness.
- **Monitoring** RNFL thickness and **performing** visual field tests on migraine patients are required due to the potential axonal damage.

Thank you