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ACOUSTIC VOCAL EVALUATION OF WOMEN WITH MIGRAINE

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Introduction

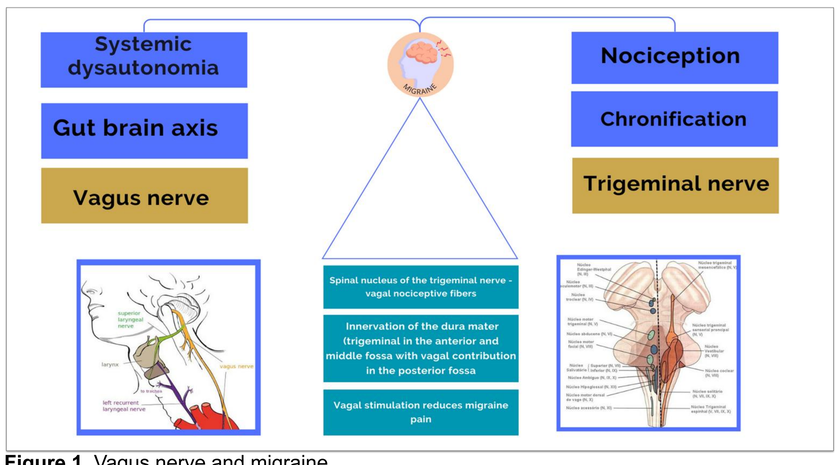

Figure 1. Vagus nerve and migraine

Objective

To acoustically analyze the voice of women with migraine.

Methods

It is a cross-sectional study employing voice recordings and the instruments Voice-Related Quality of Life, and migraine characteristics questionnaire. The variables analyzed were fundamental frequency, jitter, shimmer, loudness, glottal-to-noise excitation ratio, and phonatory deviation diagram.

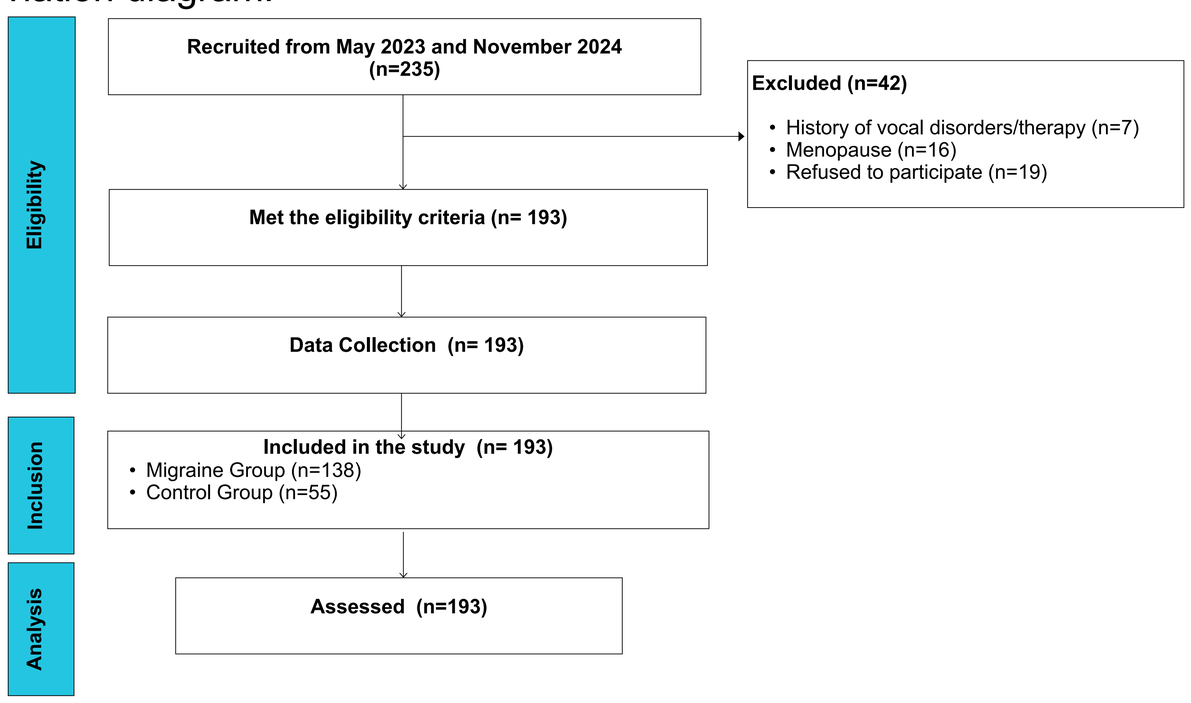

Figure 2. STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) flowchart of volunteer selection.

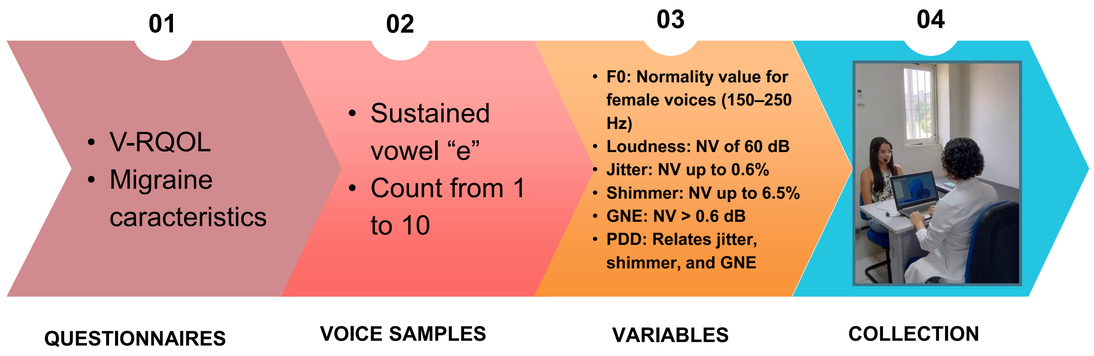

Figure 3. Data Collection Procedures, Recife 2024.

Results

A total of 193 women were assessed, 55 in the Control Group (CG) and 138 in the Migraine Group (MG), mean age of 32 ± 9.5 years. Migraineurs demonstrated altered vocal parameters of jitter, shimmer, and phonatory deviation diagram (Figure 3), and worse voice-related quality of life in the physical domain (p= 0.003) compared to Control Group. The Random Forest statistical model was able to predict with 76% of precision whether a participant belonged to the Migraine Group (Tables 1 and 2). This is the first study led by a voice specialist speech-language pathologist, opening up new possibilities for this professional group in primary headache studies. It is also the first study to demonstrate that acoustic vocal analysis distinguishes the voices of migraine participants from those of a control group with 76% precison.

Table 1. Vocal parameters alterations frequency and their mean values by group (n=193)

Vocal parameter	CG (n=55)			MG (n=138)			P
	n	%	M ± SD	n	%	M ± SD	
F0 (Hz)	3	5.4	183.4 (25.6)	3	2.2	188.6 (26.3)	0.2
Loudness (dB)	53	96.3	38.4 (5.2)	133	96.4	38.1 (5.4)	1
Jitter (%)	9	16.3	0.55 (0.9)	36	26.1	0.7 (1.5)	0.1
Shimmer (%)	10	18.2	5.1 (4.5)	32	23.2	5.4 (5.6)	0.4
Glottal to noise excitation ratio (dB)	2	3.6	0.8 (0.1)	9	6.5	0.8 (0.1)	0.4
Phonatory deviation diagram	12	21.9	Not applicable	44	31.8	Not applicable	0.2

Fundamental frequency (F0): 150–250 Hz (women); Loudness: 60 dB; Jitter: ≤0.6%; Shimmer: ≤6.5%; Glottal-to-Noise Excitation Ratio (GNE): >0.5 dB.y Phonatory Deviation Diagram (PDD): concentration in the lower left quadrant indicates normality.
M ± SD=Mean ± Standard Deviation

Table 2. Categorization of the results of the Voice-Related Quality of Life questionnaire (n=193)

Domain	Category	CG (n=55)		MG (n=138)		Total (n=193)	
		n	%	n	%	n	%
Overall	Better quality of life	50	90.9	113	81.9	163	84.5
	Intermediate quality of life	5	9.1	24	17.4	29	15
	Worse quality of life	0	0	1	0.7	1	0.5
Socio-emotional	Better quality of life	55	100	128	92.8	183	94.8
	Intermediate quality of life	0	0	9	6.5	9	4.7
	Worse quality of life	0	0	1	0.7	1	0.5
Physical	Better quality of life	53	96.4	104*	75.4	157	81.3
	Intermediate quality of life	2	3.6	30*	21.7	32	16.6
	Worse quality of life	0	0	4*	2.9	4	2.1

* Physical domain: significant difference between groups (p < 0.05). No significant differences in Overall and Socio-emotional domains (p > 0.05)

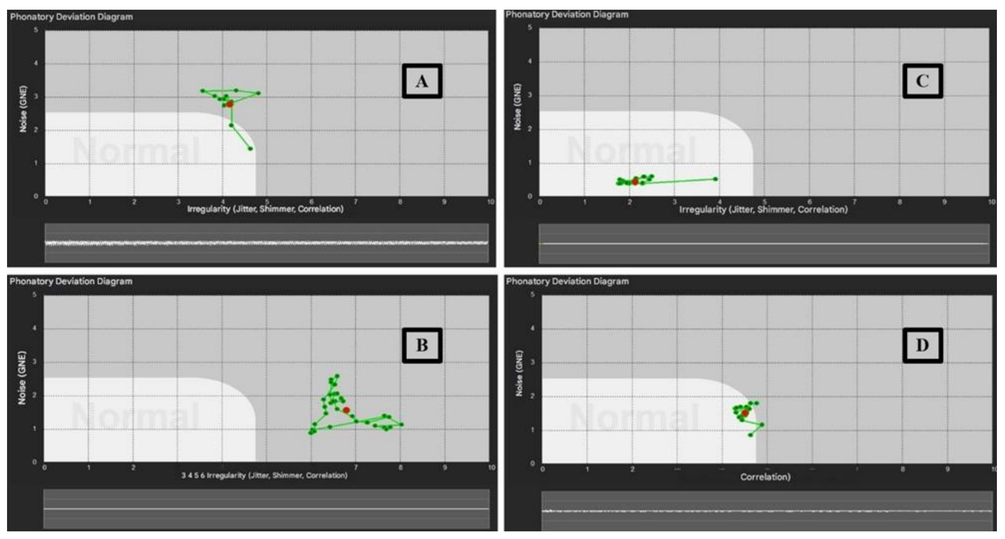

Figure 4. Phonatory Deviation Diagram (PDD) of four individual participants. Participants A and B (MG – Migraine Group) presented altered PDDs, while Participants C and D (CG – Control Group) showed normal PDDs. Each letter corresponds to a different participant.

Conclusion

The findings suggest that women with migraine experience mild dysphonia.

References

Acknowledgments