COMPARISON BETWEEN USE OF NASOMETER VERSUS NASAL RAM PRESSURE TESTING IN ASSESSMENT OF VELOPHARYNGEAL FUNCTION IN ARABIC SPEAKERS

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INTRODUCTION

The function of the velopharyngeal mechanism is to make a sealing between the soft palate and pharyngeal walls to separate the nasal and oral cavities. Throughout speech, normal velopharyngeal closure is needful to produce oral speech phonemes.
Resonance disorders can emerge due to anatomical abnormalities (i.e.velopharyngeal insufficiency), functional / articulatory problems (i.e.velopharyngeal mislearning) or neurophysiologic disorder (i.e.velopharyngeal incompetence).
Instrumental approaches to comprehend velopharyngeal function have demonstrated to have both research and clinical value, but some of these are invasive, expensive, difficult to interpret, and/or unavailable to clinicians. This study aims at use of a minimally invasive, inexpensive and simple technique to evaluate velopharyngeal function.

AIM OF THE WORK

The aim of this study was to compare the effectiveness of measuring nasal ram pressure versus nasometer II as a diagnostic tool in patients with velopharyngeal dysfunction.

PATIENTS AND METHODS

PATIENTS

The study was conducted on two groups, first group include 37 patients with velopharyngeal dysfunction and second group include 37 normal children, that attending the unit of phoniatrics, otorhinolaryngology department, Alexandria Main University hospital.

METHODS

This was a prospective study to evaluate a diagnostic test, comparing between nasal ram pressure testing and nasometer in two groups, normal group and group with VPD.

RESULTS

Validity (AUC, sensitivity, specificity) for nasometer and NRPT to discriminate VPD from control group.
The area under ROC curve (AUC) is one of the used statistics for measurement of the accuracy of a diagnostic test through determining cut-off points with highest sensitivity and specificity to differentiate between cases and controls. The larger area under the ROC curve, the more accurate the diagnostic test is .Therefore, the items that given the high diagnostic accuracy were those having AUC > 0.8.
For syllable repetition subtest all items showed high diagnostic accuracy, AUC> 0.8, except for /ma/ and /na/. For syllable repetition subtest all items showed high diagnostic accuracy, AUC> 0.8, except for /ma/, /na/, /mi/ and/ni/.

Table 1: Validity (AUC, sensitivity, specificity) for syllable repetition subtest of nasometer to discriminate VPD (n=37) from control group (n = 37)

	Cut off points	Area under the curve	Sensitivity	Specificity	p
pa,pa,pa	>11	0.988	94.59	97.30	<0.001*
ta,ta,ta	>11	0.985	97.30	100.0	<0.001*
ka,ka,ka	>16#	1.000	100.0	97.30	<0.001*
sa,sa,sa	>17#	1.000	100.0	100.0	<0.001*
ʃa, ʃa, ʃa	>19	0.989	97.30	91.89	<0.001*
xa,xa,xa	>20	0.973	89.19	94.59	<0.001*
pi,pi,pi	>19#	0.999	100.0	97.30	<0.001*
ti,ti,ti	>33#	0.910	75.68	100.0	<0.001*
ki,ki,ki	>37	0.881	64.86	94.59	<0.001*
si,si,si	>31#	0.996	97.30	97.30	<0.001*
ʃi, ʃi, ʃi	>26	0.958	94.59	78.38	<0.001*
xi,xi,xi	>22	0.939	91.89	72.97	<0.001*
ma,ma,ma	≤59	0.666	72.97	51.35	0.014*
na,ma,ma	≤61	0.621	64.86	56.76	0.073
mi,mi,mi	≤70#	0.836	83.78	70.27	<0.001*
ni,ni,ni	≤77#	0.808	86.49	59.46	<0.001*

AUC: Area Under a Curve
p value: Probability value
*: Statistically significant at p ≤ 0.05
#Cut off was choose according to Youden index

Table 2:Validity (AUC, sensitivity, specificity) for syllable repetition subtest of NRPT to discriminate VPD (n=37) from control group (n = 37)

	Cut off points	Area under the curve	Sensitivity	Specificity	P
pa,pa,pa	0#	0.986	97.30	100.0	<0.001*
ta,ta,ta	0#	0.986	97.30	100.0	<0.001*
ka,ka,ka	0#	0.973	94.59	100.0	<0.001*
sa,sa,sa	0#	1.000	100.0	100.0	<0.001*
ʃa, ʃa, ʃa	0#	1.000	100.0	100.0	<0.001*
xa,xa,xa	0#	0.986	97.30	100.0	<0.001*
pi,pi,pi	0#	0.878	100.0	75.68	<0.001*
ti,ti,ti	0#	0.878	100.0	75.68	<0.001*
ki,ki,ki	0#	0.878	100.0	75.68	<0.001*
si,si,si	0#	0.878	100.0	75.68	<0.001*
ʃi, ʃi, ʃi	0#	0.878	100.0	75.68	<0.001*
xi,xi,xi	0#	0.878	100.0	75.68	<0.001*
ma,ma,ma	–	0.500	–	–	1.000
na,na,na	–	0.500	–	–	1.000
mi,mi,mi	–	0.500	–	–	1.000
ni,ni,ni	–	0.500	–	–	1.000

AUC: Area Under a Curve
p value: Probability value
*: Statistically significant at p ≤ 0.05
#Cut off was choose according to Youden index

CONCLUSION

Nasal ram pressure testing is a minimally invasive, inexpensive and simple technique to evaluate velopharyngeal function.