P 3-56

Determining the peak cough flow values to predict Dysphagia in stroke patients

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Objective
To determine the diagnostic parameters and appropriate cut-off values of the voluntary cough flow, maximal inspiratory and expiratory pressures and determine which parameter could aid in the diagnosis of dysphagia in stroke patients.

Method
Retrospective analysis of a prospectively maintained database was done. in a single university affiliated hospital. Patients with first-ever diagnosed dysphagia attributable to cerebrovascular disease, prospectively performed spirometry measurements for the voluntary peak cough flow and respiratory pressure meters were recruited. These values were compared to patients with no evidence of dysphagia after stroke. Primary outcome measures were peak cough flow (L/min) during voluntary coughing and maximal pressure meter (cmH22O)).

Results
A total of 237 stroke patients with163 patients were diagnosed with dysphagia in through instrumental assessments. Receiver operating curve analysis showed that peak cough flow cut-off values set at 151 L/min were significantly associated with presence of dysphagia with sensitivity levels of 0.72 (0.66-0.79) and specificity levels of 0.78 (0.69-0.88) [area under the curve (AUC) 95% confidence interval (CI) = 0.81 (0.76–0.87)]. In contrast, the cut-off values set at 20 and 38 for the MIP and MEP showed lower sensitivity levels (0.49, 0.58) with lower AUC values of 0.65(0.58-0.72) and 0.70(0.64-0.77). A multivariate regression logistic regression analysis with other clinical variables revealed that only the inclusion of the peak cough flow could significantly predict the presence dysphagia with an adjusted odds ratio of 4.12 (2.20-8.69, p < 0.001).

Conclusions
Among the various respiratory parameters, the peak cough flow cut-off values of the voluntary cough flow set at 151 L /min can significantly indicate presence of dysphagia. Results advocate the Objective measurement of cough peak flow from voluntary coughing to be used as part of the formal assessment those with post-stroke dysphagia.

	non-Dysphagia	Dysphagia	se(95% CI)	sp(95% CI)	PPV(95%)	NPV(95%)	AUC(95% CI)
MBI							
>40	54	56	0.66(0.58-0.73)	0.73(0.63-0.83)	34(0.78-0.91	0.49(0.40-0.58)	0.74(0.67-0.81)
≤40	20	107					
Respiratory parameters							
Peak cough flow/ 자발적 기침 세기							
>151	58	45	0.72(0.66-0.79)	0.78(0.69-0.88)	38(0.83-0.94	0.56(0.47-0.66)	0.81(0.76-0.87)
≤151	16	118					
Pimax/ or MIP							
>20	62	83	0.49(0.41-0.57)	0.84(0.75-0.92)	37(0.80-0.94	0.43(0.35-0.51)	0.65(0.58-0.72)
≤20	12	80					
Pemax/ MEP							
>38	57	68	0.58(0.51-0.66)	0.77(0.67-0.87)	35(0.78-0.91	0.46(0.37-0.54)	0.70(0.64-0.77)
≤38	17	95					
cut- off value can be determined using ROC curve analysis (with youden index)							

Optimal Cutoff points on the ROC curve for Dysphagia