

## A Research on the Value of FIV1 in the Screening of Upper Airway Obstruction

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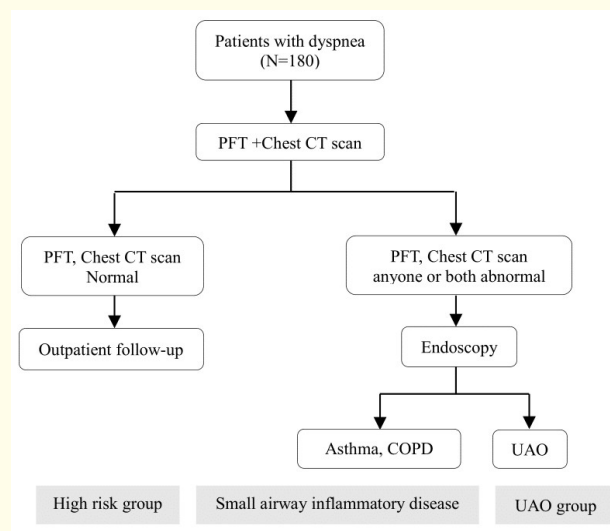
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Upper airway obstruction (UAO) prevalence rate was 1% - 7.5% [1-3]. But its clinical manifestation are not specific and easy to be confused with Asthma and Chronic Obstructive Pulmonary Disease (COPD). Therefore, at early stage, misdiagnosis rate is very high.

Currently flow - volume loop (F-V loop) in pulmonary function test (PFT) is an important method of clinical diagnosis of UAO, but F-V loop requires high cooperation from patients. Also, the higher specificity of UAO diagnosis (93.8%) and extremely low sensitivity (5.5%) makes it not suitable for screening and diagnosis at early stage [1]. Because the main clinical manifestations UAO is inspiratory dyspnea, we speculate that in PFT inspiratory flow will also decrease, so that we explore to use parameter of intake - forced inspiratory volume in first second (forced inspiratory volume in first second, FIV1 for short) to evaluate UAO. FIV1 refers to the volume of inhaled in the first second when patients try to inhale as soon and hard as possible.

This research intend to screen the individuals of UAO by FIV1 and observe 161 patients with dyspnea from January 1<sup>st</sup> 2013 to July 31<sup>th</sup> 2015 in Shanghai, China. All individuals had been conducted Pulmonary Function Test (PFT) and chest CT scan. If anything, abnormal found in PFT and CT scan, further endoscopy will be done. Then we put them into three groups, 52 in UAO group, 52 in small airway inflammatory disease (SAID) group (such as asthma or COPD) and 57 in high risk group (dyspnea but chest CT and pulmonary function test is normal) (Figure 1).



**Figure 1**

Statistical analysis showed that more female than male in the UAO group, and significantly more male than female in the airway inflammatory disease group; UAO group significantly younger than another two groups. It is understandable, because in China the high percentage of tuberculosis in youth increases the morbidity of UAO. In the meantime, the majority people of SAID group are COPD patients of the male smokers at middle-aged and older people.

By the pairwise comparison of FIV1 in the groups of UAO, SAID and high risk; it is found that the FIV1 level of UAO group and SAID group is significantly lower than it in high risk group. Hence, the FIV1 level in UAO group decreases in a more significant way than it in SAID group with a statistical significance ( $P < 0.001$ ) (Figure 2).

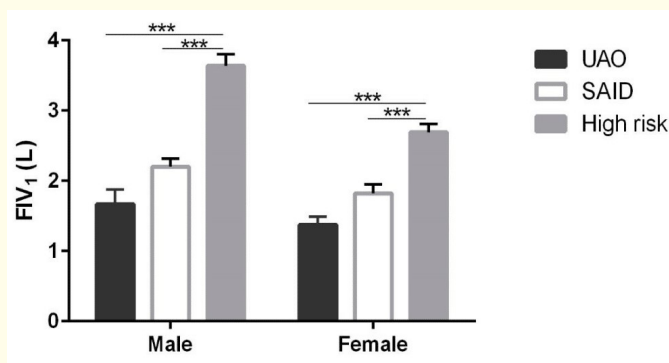


Figure 2

After screening of suspicious UAO patients of dyspnea by using the PFT parameters such as FIV1, this study found that FIV1 decreased significantly ( $P < 0.05$ ) in patients with UAO, and its negative predictive value close to 100% (99.51 - 99.01%). There are both higher specificity (96.49%) and sensitivity (76.92%) in screening UAO by FIV1 than the same by F-V loop; in the meantime, the misdiagnosis rate of FIV1 is lower (only 3.51%). So, this research indicates that FIV1 could be a better way to screen UAO than the currently widely used F-V loop.

## Fund

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