CLINICAL APPLICATION OF RHINOMANOMETRY

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The main purpose of this paper is to provoke a discussion of the need of standardization of rhinomanometric tests. I myself think that at least certain tests have already been practised widely and long enough to be on the level of a recognized clinical test. If an international agreement would exist, the importance of rhinomanometric investigation would very quickly gain general acceptance and further the aims of all Rhinologic Societies.
In the ear, nose and throat department of the University Hospital of Turku, Finland, the following rhinomanometric testing method has been used in routine work:

Pressure test by posterior rhinomanometry

The testee is asked to take a no. 14 sponge cuff oxygen catheter in his or her mouth and to breathe quietly. When a proper registration seems possible, the recording is started and continued for 4 to 6 breaths. The nostrils are alternately closed tightly without distorting the external pyramid and recording is continued during 4 to 6 breaths through each nostril. After trials with several kinds of obturators, we found that the fingertip of the examiner is the most effective and the most sensitive obturator.
Unfortunately, the posterior technique is not applicable to all patients due to a sensitive swallowing reflex. In our series of more than 200 patients, a successful posterior recording was possible in about 50%. Still we apply the posterior rhinomanometry as a valuable control of the effect of distortion in anterior rhinomanometry.

Pressure test by anterior rhinomanometry

In this, the main test, a nostril nozzle is used. Although the anterior test can be applied to all patients, the possible effect of distortion of the external pyramid must be kept in mind. The preliminary anterior test is made with the patient sitting and without introducing any medication into the nose. Both sides are tested; it may be unnecessary to say that the right side is tested through the left nostril and vice versa. If normal pressures are found in the preliminary test, we proceed directly to positional tests. If elevated pressures are recorded in the preliminary anterior test, a shrinkage is effected either by a standard exercise or by drugs. As a rule, positional tests are made only after shrinkage.
The following scheme gives the results of anterior rhinomanometry in an actual patient.

Anterior rhinomanometry

Nozzle: Polizer type. Medication: N.M.
RN: UP 42/36 SUP 38/34 RSU 56/38 dil 46/34 RD 60/28 f = 17—18/min.
LN: UP 16/14 SUP 16/13 LSU 16/13 dil 6/6 LD 10/8 f = 18—20/min.
A.S. (adr. + anest. 4% 3 min. before testing).
RN: UP 34/18 dil 24/13 RSU 39/22 dil 30/20 RD 34/19 f = 16—17/min.
LN: UP 20/14 LSU 13/10 dil 8/7 LD 14/8 f = 17—18/min.

The abbreviations used are the following:

A.S. = after shrinkage
dil = dilatation test
f = breathing rate
LD = left side down (the left nostril is tested when the testee is lying on his left side)
LN = left nostril tested
LSU = left side up (the left nostril is tested when the testee is lying on his right side)
N.M. = no medication
RD = right side down (the right nostril is tested when the testee is lying on his right side)
RN = right nostril tested
RSU = right side up (the right nostril is tested when the testee is lying on his left side)
SUP = supine (the testee is lying on his back)
UP = upright (the patient is sitting)

The figure in the nominator is the average inspiratory pressure in mm of water. The figure in the denominator is the average expiratory pressure in mm of water.

The pressure flow test

In the pressure flow test, we have endeavoured to measure the true flow through the nose. We use an ordinary diver's mask connected to a Fleisch pneumotachograph. This mask has fitted the heads of all patients examined so far. The simultaneous pressure recording is made through an oxygen catheter with a spongy cuff made airtight with paraffin oil and vaseline. This kind of catheter has been successfully used instead of a nozzle in case the latter causes significant distortion of the external pyramid also in the pressure test. We record simultaneously both the pressure and the air flow with the patient lying supine during quiet respiration and during forced respiration.
The result of the pressure flow test in an actual patient may be like the following.
Pressure flow test: Nozzle: No. 10 oxyg. catheter. Medication: A.S.

RN: SUP quiet respiration: 24/20 flow 8.7 l/min. f = 14/min.,
forced respiration: 120/85 flow 22.0 l/min. f = 29/min.
LN: SUP quiet respiration: 16/16 flow 10.3 l/min. f = 18/min.,
forced respiration: 120/100 flow 31.4 l/min. f = 33/min.

A summary of the rhinomanometric findings is given at the end of the rhino-

manometry form. In this summary, any irregularities, either in the rate of the breathing or in the shape of the curve, are reported.
The following 4 points are recommended for international standardization at this time.

1. The speed of the recording paper should be 5 mm./sec.
2. The calibration of the pressure recording should be adjusted so that a pressure of 20 mm. of water gives a 10 mm. deflection from the baseline on the paper.
3. The inspiratory phase when the pressure in the nasopharynx is less than the ambient pressure should be drawn below the baseline and the expiratory phase above the baseline on the paper.
4. Oscillations of the flow curve should be equal in height to the oscillations of the pressure curve in normal subjects during quiet respiration. In our apparatus the appropriate calibration is that a flow of 1.65 l/sec. (= 99 l/min.) gives a deflection of 25 mm. from the baseline; for the volume integrating system a calibration is adjusted where 1 liter is represented by a deflection of 10 mm.

Mr. Chairman. I would like to propose as one of the important and immediate tasks of our Society to decide whether an international standardization of rhinomanometric testing should be recommended or not. In case the standardization is agreed as desirable, the Society should undertake appropriate measures.

SUMMARY

An application of rhinomanometric testing is reported with the aim of encouraging discussion of the need of standardization of this test for clinical use.

RÉSUMÉ

Une application des tests rhino-manométriques est relatée dans le but de faire apparaître le besoin d'une standardisation de ces tests en clinique.

REFERENCES

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