

Vital Capacity and the Forced Expiratory Volume in one second (ii) a mini Peak Flow Meter (Breath Med) which is indigenously made and is a small tubular instrument which requires neither electric power nor a battery. It has an indication which moves along a scale calibrated in litres per min from 60 to 800 lit/min. Readings are taken after a forced breathing following a maximal inspiration.

Measurements were made in 92 subjects, of whom 53 were men between 20 and 84 years of age (mean and standard deviation 48.5 ± 16.2) and 39 women between the ages of 21 and 75 years (48.1 ± 15.5). The subjects comprised the staff of the institute, patients undergoing treatment for chronic arthritis, and relatives accompanying the patients. Each subject performed the manoeuvre three times with each instrument and the highest value accepted as the PEF. The data were statistically analysed.

RESULTS AND DISCUSSION

The mean values with standard error (SE) for each group and the whole group are shown in the Table. The values of PEF(S) and PEF(M) i.e., with the Spirocheck and PFM and identical in 14 subjects (8 men and 6 women). In 54 subjects (32 men and 22 women) the differences were within 10% and statistically not significant. In 24 subjects (13 men and 11 women) the differences were in excess of 10% and statistically significant. However, in the whole group the mean difference was only about 6% and not significant.

The Spirocheck values were generally lower than the Peak Flow Meter readings. In the group in which the differences were within 10%, the PEF(M) was higher by a percent mean and standard deviation of $5.0\% \pm 2.6$ in 25 men and $7.6\% \pm 2.5$ in 14 women. In 7 men

TABLE I : Showing comparative data of Peak Expiratory Flow Rates.

| Category | Number | PEF(S) | | PEF(M) in lit/min | |
|------------------------------------|--------|--------|------|-------------------|------|
| | | Mean | SE | Mean | SE |
| <i>Values identical</i> | | | | | |
| Males | 8 | 350.0 | 32.6 | 350.0 | 32.6 |
| Females | 6 | 329.2 | 22.4 | 329.2 | 22.4 |
| Total | 14 | 341.1 | 20.5 | 341.1 | 20.5 |
| <i>Difference upto 10%</i> | | | | | |
| Males | 32 | 476.3 | 22.5 | 483.7 | 24.9 |
| Females | 22 | 278.9 | 15.5 | 288.9 | 15.5 |
| Total | 54 | 395.9 | 19.6 | 404.4 | 20.5 |
| <i>Difference in excess of 10%</i> | | | | | |
| Males | 13 | 334.2 | 28.4 | 398.7 | 31.1 |
| Females | 11 | 270.9 | 20.0 | 323.6 | 19.6 |
| Total | 24 | 305.2 | 18.9 | 364.4 | 20.3 |
| <i>Whole group</i> | | | | | |
| Males | 53 | 422.4 | 18.9 | 442.7 | 18.8 |
| Females | 39 | 284.4 | 11.1 | 305.4 | 11.2 |
| Total | 92 | 363.5 | 14.7 | 384.4 | 15.2 |

(S) is Spirocheck, (M) is Peak Flow Meter and SE is Standard Error

and 8 women the PEF(S) was higher by $4.5\% \pm 2.3$ and $4.7\% \pm 2.1$ respectively. In the group in which the differences were in excess of 10%, only one male and one female subject had a higher PEF(S), by 18.8% and 14.3% respectively. In the remaining 12 men and 10 women the PEF(M) was higher by $24.7\% \pm 12.1$ and $25.7\% \pm 13.4$ respectively.

The correlation between the PEF(S) and PEF(M) was highly significant in all the groups, the correlation coefficients being 0.954 in the within 10% difference group, 0.878 in the group in which the difference was in excess of 10%, and 0.93 for the whole group. The regression equation derived for the whole group was, $PEF(M) = 0.961 \times PEF(S) + 34.9$, with a standard error of estimate of 53.0 litres. With this prediction formula, the PEF(S) of 200,

300, 400, 500 and 600 lit/min correspond to PEF(M) values of 227, 323, 419, 515 and 611 lit/min respectively. Hence it is adequate if 27 to 23 is added to PEF(S) values between 200 and 300, 21 to 17 to values between 350 and 450, and 15 to 11 for value between 500 and 600, when a Spirocheck value is compared with an expected value obtained with a prediction formula based on the Peak Flow Meter data, for evaluating patients for pulmonary impairment.

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REFERENCES

1. Wright BM, Mckerrow CB. Maximum Forced Expiratory Flow Rate as a measure of ventilatory capacity. *Brit Med J* 1959; 2; 1041-1046.
2. Leiner GC, Abramowitz S, Small MJ, Stenby VB, Lewis WA. Peak Expiratory Flow Rates. *Am Rev Resp Dis* 1963; 88 : 644-651.
3. Singh HD. Peak Expiratory Flow Rate in Indians. *J Physiol Pharmacol* 1967; 11 : 121-122
4. Singh HD, Peri S. Peak Expiratory Flow Rate in South Indian adults. *Indian J Physiol Pharmacol* 1979; 23: 315-323.
5. Kamat SR, Sarma GS, Raju VRK, Venkataraman C, Balakrishnan M, Bhavsar RC, Kulkarni ST, Malhotra MS. *J Assoc Phys Ind* 1977; 25: 1-16.
6. Malik SK, Jindal SK, Jindal V, Bansal S. Peak Expiratory Flow Rate in healthy adults. *Ind J Chest Dis* 1975; 17 : 166-171.
7. Nunn JF. Applied Respiratory Physiology. *London Butterworths* 1972; p.171.