

# LETTER TO THE EDITOR

SING MED J. 1989; NO 30: 509-510

Dear Sir,

I read with interest the paper by **T H Cheong** and his colleagues in the December issue of the Singapore Medical Journal describing the breathing patterns in local normal men [SMJ 1988; 29:570-4]. They have been careful in using the inductance technique with validation before and after 2 minute epochs of data recording. Nevertheless, I disagree that based on the data reported they can conclude that there are clinically significant ethnic differences in the breathing pattern particularly in relation to changes in posture. It is well known that there may be a wide variation in both the depth and timing of breathing even when observed over a short period of time and when subjected to unfamiliar equipment in the laboratory. I suggest that the small and inconsistent differences measured in a few subjects observed over a short time interval may prove to be in serious error if extrapolated to the population at large. Moreover, I note that in Experiment I, the validation ratios differed by greater than 10% in a third [5/16] of the subjects indicating a large degree of intra-subject error. Unless a larger number of subjects

are studied with confirmation by other workers I would not conclude with the authors that Chinese men breathe differently from Indians. The sexes certainly do not differ in their breathing pattern and I doubt if there are any differences in between the races.

In their discussion on the effects of supine posture on the coupling between rib-cage movement and the diaphragm **T H Cheong** et al related the abdominal muscle contraction to the operating length of the diaphragm but they did not comment on the effect of abdominal muscle tone upon the relative *compliance* of the rib-cage and abdominal compartments. This may have a large influence on the relative rib-cage versus abdominal wall contribution to the tidal volume in relation to posture change. Furthermore, there is a complex and incompletely defined interaction between the insertional and appositional forces of the diaphragm on one hand and the area of the zone of apposition on the other. These factors should also be considered when discussing the effect of posture on breathing patterns [1].

## REFERENCE

1. De Troyer A, Loring SH. Action of the respiratory muscles. In the Respiratory System Volume III, Part 2. pp. 443-461. eds Macklem PT, Mead J. Handbook of Physiology. American Physiological Society. 1986.

Sincerely,

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## AUTHORS' REPLY

Dear Sir,

In the letter by Dr Lim, it was stated that "there may be a wide variation in both the depth and timing of breathing ..... when subjected to unfamiliar equipment in the laboratory". This would be an argument against the reliability of the measurements of resting ventilation in our subjects.

The purpose of our study (1), as stated in our paper, was to investigate if there was any difference in the pattern of breathing between young Indian and Chinese males at rest, in response to posture change, and during respiratory manoeuvres. This arose out of our clinical impression that liver palpation was easier in Indians than in Chinese and that breathing appeared more irregular during the measurement of functional residual capacity in Chinese. Measurements of resting breathing were taken only after the recording showed a stable breathing pattern. Despite this it may still be argued (as it can be argued whenever attempts are made to measure resting breathing) that any attempt to measure breathing may itself alter the breathing pattern. It would then be impossible to measure resting breathing.

Even with noninvasive methods of measuring ventilation, "spontaneous breathing" may not be completely free of behavioural influences. Indeed, when is spontaneous breathing ever truly free of behavioural effects in the awake state when external factors such as an unfamiliar environment or internal factors such as emotions and thoughts may affect the breathing pattern? In our study, we applied the same experimental protocol to both groups of subjects so that whatever external influences, eg unfamiliar laboratory equipment, applied equally to both groups. Also, the similarity of our group of subjects, in terms of response to posture, to the group studied by Sharp et al (2) provides further evidence that our subjects were not abnormally stimulated during the study.

Lack of differences in breathing pattern between males and females by no means excludes the possibility of differences between ethnic groups. Whether the physiologic differences found translate into clinical differences was not the subject of our study and therefore any comments on the clinical implications will be entirely speculative.

Relative rib cage and abdominal contributions to chest wall displacement may be explained mechanistically, but spinal reflexes may also influence breathing patterns. As our study was not designed to partition these effects we chose not to speculate beyond what we did.

Dr Lim expressed his opinion that "I doubt if there are any differences in between the races", an opinion which we believe is based on intuition rather than data. Based on our data, we have found differences during resting breathing between the Chinese and Indians whom we studied.

## REFERENCES

1. TH Cheong, ALW Chan, DR Koh, YT Wang, SC Poh. Breathing patterns in young male adult Chinese and Indians. Singapore Med J 1988; 29:570-4.
2. JT Sharp, NB Goldberg, WS Druz, J Danon. Relative contributions of rib cage and abdomen to breathing in normal subjects. J Appl Physiol 1975; 39:608-18.

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## BOOK REVIEW

# A Practical Manual on Acute Paediatrics

Editors: Dr W C L Yip and Dr J S H Tay  
1989. PG Publishing.

This Manual gives a comprehensive and concise account of the acute clinical problems encountered in the management of common paediatric problems in the local scene. It puts into the written language what is usually taught to house officers and residents in the wards.

In Paediatrics, the history is usually second hand. Experience and a keen clinical acumen is required for the interpretation of patients' signs and symptoms. It is with this in mind that the authors (from the Paediatric Department of the National University Hospital) have written this book. It starts off with the salient points to look for in a critically ill child and then expands into the different conditions by systems and common acute

illnesses often encountered. A useful section on instrumentation and mechanical ventilation has been included. It concludes as usual with the paediatric pharmacopoea.

Although each section is written by a different author, the format is similar using the problem oriented system. It is easy to read and follow. However, in trying to keep it brief as a Manual, some sacrifice at the expense of pathophysiology of the conditions had been made. Nevertheless it makes a useful handbook for junior house-staff and doctors aiming to treat children.

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