

# conversations with Charles

## Joy's index

*I know that Charles is less than satisfied with the index (Mass/waist<sup>2</sup> × span)<sup>1</sup> that he suggested to replace body mass index (BMI) despite its potential virtues of being truly independent of size and being positively related to good nutrition, robust health and prolonged survival. My wife, Joy, a laywoman, in medical matters, had produced an alternative. I decided to tease Charles and raise the matter again*

‘Charles, you remember that you suggested some time ago that an index which is calculated by dividing weight by waist squared and span might be a better proxy for inappropriate obesity and predictor of survival than BMI? I liked the idea at the time. Do you think it would have been taken up had it been published more formally?’

**‘I think not!’ he replied with obvious regret. ‘There could be no real hope as it involves making three separate measurements with two or three different instruments depending on whether you use span or height. This is too much trouble for people and a calculation involving three numbers is likely to be seen as over complicated.’**

‘It is not like you to be so cynical, Charles!’

**‘Perhaps, but nevertheless realistic, Coe!’**

‘So we are stuck with BMI! After all it is a satisfactory proxy for obesity in most people.’

**‘But even though shape and other confounders tend to widen the range of height over which a single standard is acceptable, BMI is proportional to height and this should be more widely recognised.’**

‘I agree that education is of professionals, let alone the public, in this respect!’

**‘That is by no means my principle concern. The political and financial context must be considered. As you well know for obvious emotional reasons heart disease attracts disproportionate attention and funds.’**

‘Yes only the other day I was talking to a frustrated doctor active in the British Lung Foundation who told me that the British Heart Foundation has 10 times the income, and yet the lungs are at least as important as the heart to survival?’ *I intervened.*

*Charles continued, ‘Given this dominance in resources, it is unsurprising that BMI is nearly always presented to the*

*public as a measure of obesity and so to be kept as low as possible. Yet, I often feel that those who are so concerned about obesity forget that it is a by product of the greatly enhanced nutrition of the population that is probably a major factor in the growth in height and survival of many populations over the last hundred years.’*

‘I hadn’t thought of it that way Charles!’

**‘And what hazards does a low BMI reflect? Respiratory?’**

‘You will not be surprised to know in at least one paper from the cardiovascular lobby it was suggested that it merely reflected the consequences of existing disease!’

**‘I can see you find that hard to swallow, Coe!’**

‘Yes!’ *I replied, ‘Indeed the major long-term cause of mortality associated with a low BMI is respiratory illness. It seems to me that not being endowed with much muscle might reduce one’s ability to cough possibly at the critical moment! Indeed, I understand that the best single predictor of morbidity and mortality, including cardiovascular problems, is the simple blowing test, the FEV<sub>1</sub>!’*

**‘The implication being that inadequate nutrition is more a major cause than an effect of respiratory disease?’**

‘I am sure it is, Charles!’

**‘BMI underestimates the extent of underweight in tall people. As we agreed, shape and other factors ameliorate the overestimation of obesity at the other end of the scale, but I am less convinced they do so at this end. In other words a ‘normal’ BMI might falsely convince tall patients and their carers that they are adequately nourished.’**

‘True but surely education can overcome that!’ *I suggested.*

**‘Possibly, Coe, but I am much more attracted to the virtues of my suggested, but doomed, index in that it was independent of size and reflected nutrition positively and malnutrition, in whatever direction, negatively.’**

‘Well here is a recent article<sup>2</sup> which turns attention to the thighs...’

*Charles’s eyes lit up as he interrupted, ‘Don’t tell me that my prejudices are confirmed and big thighs are associated with a long and healthy life.’<sup>3</sup> Even in my youth I was never enamoured with the Twiggy’s of this world.’*

‘Counterintuitive it may be, that’s right’ *I replied, adding, ‘It must reflect good musculature including albeit indirectly, but critically, respiratory!’<sup>3</sup>*

**'And good fat?' he suggested, 'That which insulates you from the cold?'**

'And that is where Joy comes in,' I replied.

**'How so Coe?'**

'I knew that you would be so pleased by this that I read it out loud to her, saying so. She replied that you always had preferred well endowed girls as long as you could put your arm round their waist and after a moment exclaimed "That's the answer!"'

Again Charles asked, **'How so?'**

'She then suggested that dividing thigh circumference by waist would be even better.'

For a moment Charles looked flabbergasted, but quickly recovered.

**'Brilliant!' he said, 'Dimensionless! A true index and the bigger the better! I always knew that Joy is a wily old bird!'**

'I am not sure she would take that as a compliment, Charles!' said I coming to my wife's defence and then continued, 'But let's give her credit by calling it Joy's index.'

**'One tape measure and two measurements in close proximity – what could be easier!'**

We continued the conversation and Charles again wondered whether height contributed in the analysis suggesting that small people do benefit from better skin cover and speculated if the relationship with Joy's index might be steeper in shorter people for this reason.

## References

- 1 Coemgenus. What is wrong with the Body Mass Index? *Clin Med* 2005;5:301–2.
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- 4 Marquis K, Debigaré R, Lacasse Y *et al.* Mid-thigh muscle cross-sectional area is a better predictor of mortality than body mass index in patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2002;166:809–13.

Coemgenus

## RCP BOOKS

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