LETTERS TO THE EDITOR

Mathematical Models in Medical Sciences: a balance in Knowledge

The Editor,

Sir

Mathematical models are essential for refining laboratory/clinical experimental data since such experimental observations are subject to time constraint. Bone regeneration mathematical modelling (an important phenomenon in biological science and tissue engineering) has attracted desirable attention in the literature (1–8).

The osteobstruction mechanism in bone regeneration which was coincidentally discovered during a sequential Spectroscopy (SPECT), histological and histomorphometric analysis on animal model in the validation of the Ogunsalu sandwich bone regeneration technique (9–11) recently gain international attention in terms of mathematical modelling. This osteobstruction revealed itself by a series of overtaking and re-overtaking phenomenon on SPECT during the sequential evaluation of the outcome of the animal experiment.

Most models have been used to investigate the influence of (i) cell-cell and cell-scaffold interactions and (ii) the mechanical environment on tissue growth. Investigated by Ogunsalu and Arunaye, the newly discovered osteobstuction mechanism of bone regeneration utilized mathematical models to generalize the findings of one of the authors experiment which cannot be observed infinitely. This mathematical work actually assisted in balancing the knowledge which has been obtained from the original experiments analysed by means of expensive and laborious laboratory means such as SPECT and bone tissue histology.

Fisher's equation was utilized to describe the bone cells mobilizations during bone regeneration done by two different techniques: the single GTR (the conventional GTR) and the Double GTR (the Ogunsalu sandwich bone regeneration technique).

We strongly assert that mathematical models be used to predict, interpret and generalize the osteoblastic phenomenon with desirable precisions as solutions to equations mentioned are attainable. As scientist, we must balance and extend knowledge with mathematical models.

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