Child dummy finite element models development: a review

ABSTRACT

Advancement in computer aided engineering has made it possible to apply finite element (FE) analysis in crash simulations. Biofidelic dummy FE models are necessary for the application of FE methods in both design and evaluation of cars. Anthropomorphic test device (ATD) and human models are numerical tools designed to imitate real human being response and measure moments, forces and accelerations experienced by human body during crash, which will give data to quantify the severity of injury that the body sustained. While adult FE models have been extensively studied, children models need more vigorous research works to enhance their biofidelity. This paper provides a review on the child FE models with the aim of highlighting the development made so far and work needed to be carried out to enhance the biofidelity of the models. The review is divided in to six parts: child human models, ATD child models, head models, neck models, anthropometry, and model validation.

Keyword: Anthropometry; ATD; Child dummy; Fininte element modelling; Human model; Validation