

Single dose oral challenges to validate eliciting doses in children with cow's milk allergy

Paul Turner¹, Yvonne D'Art², Bettina Duca¹, Guadalupe Marco Martin³, Rosialzira Vera-Berrios³, Olaya Alvarez⁴, Raphaëlle Bazire⁴, Pablo Rodriguez del Rio⁵, Marta Vazquez-Ortiz¹, Joe Baumert⁶, Ronald Van Ree⁷, Clare Mills⁸, Montserrat Fernandez-Rivas⁹, and Jonathan Hourihane¹⁰

¹Imperial College London

²University College Cork

³Hospital Clinico Universitario San Carlos

⁴Hospital Infantil Universitario Niño Jesús

⁵Hospital Infantil Universitario Niño Jesús

⁶University of Nebraska

⁷Amsterdam University Medical Centres

⁸University of Manchester

⁹Hospital Clinico San Carlos

¹⁰Royal College of Surgeons in Ireland Faculty of Medicine and Health Sciences

October 9, 2020

Abstract

Background: There is increasing interest in the use of eliciting doses (EDs) to inform allergen risk management. EDs can be estimated from the distribution of threshold doses for allergic subjects undergoing food challenges within a specified population. Estimated ED05 values for cow's milk (the dose expected to cause objective allergic symptoms in 5% of the milk-allergic population) range from 0.5mg to 13.9mg cow's milk protein. We undertook a single-dose challenge study to validate a predicted ED05 for cow's milk of 0.5mg protein. Methods: Participants were recruited from 4 clinical centres. Predetermined criteria were used to identify patients reacting to 0.5mg cow's milk protein (approximately 0.015ml of fresh cow's milk). Children over 1 year underwent formal challenge to cow's milk to confirm clinical reactivity. Results: 172 children (median age 6 (IQR 0.7-11) years, 57% male) were included in this analysis. Twelve (7.0%, 95% CI 3.7-11.9%) children experienced objective symptoms that met the predetermined criteria. One participant had mild anaphylaxis which responded to a single dose of adrenaline, the remainder experienced only mild symptoms with no treatment required. We did not identify any baseline predictors of sensitisation which were associated with objective reactivity to the single-dose challenge using 0.5mg cow's milk protein. Conclusions: These data support an estimated ED05 for cow's milk of 0.5mg protein. Values for ED05 above 0.5mg for cow's milk protein proposed for allergen risk management need to be reviewed.

Hosted file

CM OneSHOTS submitted.pdf available at <https://authorea.com/users/360709/articles/485658-single-dose-oral-challenges-to-validate-eliciting-doses-in-children-with-cow-s-milk-allergy>