Asthma prescribing according to Arg16Gly beta-2 genotype: a randomised trial in adolescents

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Personalised prescribing in adolescents with asthma demonstrated that β_2-adrenoreceptor genotype directed treatment results in a small but significant improvement in PAQLQ. β_2-adrenoreceptor genotype guided treatment requires further investigation. https://bit.ly/3oDvP1N

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Abstract

Introduction The A allele of rs1042713 (Arg16 amino acid) in the β_2-adrenoreceptor is associated with poor response to long-acting β_2-agonist (LABA) in young people with asthma. Our aim was to assess whether the prescribing of second-line controller with LABA or a leukotriene receptor antagonist according to Arg16Gly genotype would result in improvements in Pediatric Asthma-Related Quality of Life Questionnaire (PAQLQ).

Methods We performed a pragmatic randomised controlled trial (RCT) *via* a primary care clinical research network covering England and Scotland. We enrolled participants aged 12–18 years with asthma taking inhaled corticosteroids. 241 participants (mean±SD age 14.7±1.91 years) were randomised (1:1) to receive personalised care (genotype directed prescribing) or standard guideline care. Following a 4-week run-in participants were followed for 12 months. The primary outcome measure was change in PAQLQ. Asthma control, asthma exacerbation frequency and healthcare utilisation were secondary outcomes.

Results Genotype-directed prescribing resulted in an improvement in PAQLQ compared to standard care (0.16, 95% CI 0.00–0.31; p=0.049), although this improvement was below the pre-determined clinical threshold of 0.25. The AA genotype was associated with a larger improvement in PAQLQ with personalised *versus* standard care (0.42, 95% CI 0.02–0.81; p=0.041).

Conclusion This is the first RCT demonstrating that genotype-driven asthma prescribing is associated with a significant improvement in a clinical outcome compared to standard care. Adolescents with the AA homozygous genotype benefited most. The potential role of such β_2-adrenoceptor genotype directed therapy in younger and more severe childhood asthma warrants further exploration.