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The impact on antibiotic use of routine molecular point-of-care testing for respiratory viruses in adults presenting to hospital with acute respiratory illness; results of a pragmatic randomized controlled trial

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Background: Antibiotics are prescribed to the vast majority of adults hospitalised with acute respiratory illness (ARI) including in clinical groups where viruses are strongly implicated as causative pathogens. Rapid molecular platforms have equivalent accuracy to laboratory PCR and can generate result in 1 hour making them deployable as a point-of-care test (POCT). Routine use of POCTs for respiratory viruses in adults presenting to hospital with ARI may reduce unnecessary antibiotic use.

Material/methods: The ResPOC trial was a pragmatic, parallel-group, open-label, randomised controlled trial evaluating the impact of POCT in adults presenting with ARI to University Hospital Southampton NHS Foundation Trust, UK, over two winters. Patients were randomly allocated 1:1 to POCT for respiratory viruses using the FilmArray Respiratory Panel or routine clinical care. Randomisation was via internet-based randomisation service using random permuted blocks. POCT group results were communicated directly to the clinical team. The primary outcome was the proportion of participants who received antibiotics. Secondary outcomes included antibiotic duration, the proportion of patients who received only a single dose of antibiotics, and the proportion of patients who received less than 48 hours of antibiotics.

Results: 720 patients were randomised (362 to POCT and 358 to routine care). 360 and 354 were analysed in the modified intention-to-treat analysis. 301 (83.6%) of 360 participants received antibiotics in the POCT group compared with 294 (83.1%) of 354 in the control group, adjusted odds

ratio 0.99 (95%CI 0.57 to 1.70), p=0.957. Mean (SD) duration of antibiotic use was 7.2 (5.1) days in the POCT group compared with 7.7 (4.9) days, p=0.174.

Antibiotic-treated patients in the POCT group more frequently received only a single dose of antibiotic, 31 (10%) of 301 versus 10 (3.4%) of 294, p=0.001, and more frequently received <48 hours of antibiotics, 50 (17%) of 301 versus 26 (8.8%) of 294, p=0.005.

In subgroup analysis, patients with asthma exacerbations received shorter courses of antibiotics in the POCT group than control; 3.9 versus 5.3 days, p=0.038, and received more single doses only, 14 (33%) of 43 versus 3 (8%) of 36, p=0.009, and received <48 hours of antibiotics more frequently, 18 (42%) of 43 versus 4 (11%) of 36, p=0.002. Patients with COPD exacerbations in the POCT group received shorter courses of antibiotics, 6.1 versus 8.0 days, p=0.008, and more frequently received <48 hours of antibiotics, 11 (15%) of 75 versus 3 (4%) of 75, p=0.025.

There were no differences in adverse events between groups: 77 (21%) of 360 versus 88 (25%) of 354, p=0.29.

Conclusions: Routine molecular POCT for respiratory viruses in adults presenting to hospital with ARI did not reduce the proportion of patients receiving antibiotics, but did shorten the duration of antibiotics given in patients with exacerbation of airways disease.