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Proceedings Paper:

Hoo, Z., Campbell, M.J., Curley, R. et al. (1 more author) (2016) Rescue and prevention in cystic fibrosis: an exploration of the impact of adherence to preventative nebulised therapy upon subsequent rescue therapy with IV antibiotics in adults with CF. In: Journal of Cystic Fibrosis. ECFS Conference 2016, 8 -11 June, 2016, Basel, Switzerland. Elsevier , S120-S120.

[https://doi.org/10.1016/S1569-1993\(16\)30506-9](https://doi.org/10.1016/S1569-1993(16)30506-9)

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Topic: 15 Epidemiology / Registry

Title: Rescue and prevention in CF: an exploration of the impact of adherence to preventative nebulised therapy upon subsequent rescue therapy with IV antibiotics in adults with CF

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Text: Background

The UK CF registry analysis showed that people with prior high levels of rescue will often continue to need high levels of rescue. We hypothesised that low preventative nebuliser adherence is an important predictor for rescue IV use. The UK CF registry does not record adherence data. We therefore analyse I-neb® adherence data alongside IV use data from the Sheffield Adult CF centre.

Methods

Objective adherence was calculated for those with ≥3 months of I-neb® data. Those on ivacaftor were excluded. A tree-based method (Zhang & Bracken, AJE 1996) was used to divide the study sample into clinically meaningful subgroups based on results of the UK CF registry analysis. For each subgroup, IV use in 2013 & 2014 are compared among those with adherence ≥80% vs < 80%. This cut-off for ‘good adherence’ was based on previous studies.

Results

For each clinical subgroup, people with good adherence tend to need fewer IV.

| | Prior year IV ≤14 days, current FEV1 ≥70% and objective nebuliser adherence ≥80% | Prior year IV ≤14 days, current FEV1 ≥70% and objective nebuliser adherence <80% | Prior year IV >14 days, current FEV1 ≥70% and objective nebuliser adherence ≥80% | Prior year IV >14 days, current FEV1 ≥70% and objective nebuliser adherence <80% | Prior year IV ≤14 days, current FEV1 <70% and objective nebuliser adherence ≥80% | Prior year IV ≤14 days, current FEV1 <70% and objective nebuliser adherence <80% | Prior year IV >14 days, current FEV1 <70% and objective nebuliser adherence ≥80% | Prior year IV >14 days, current FEV1 <70% and objective nebuliser adherence <80% | One way ANOVA (comparing across the 8 groups) p-value |
|--------------------------------|--|--|--|--|--|--|--|--|---|
| 2013: number of adults with CF | 7 | 32 | 1 | 16 | 1 | 8 | 1 | 24 | |
| 2013: IV days, mean (SD) | 3.0 (5.5) | 13.3 (13.4) | 14 ** | 44.0 (25.3) | 0 ** | 13.8 (18.3) | 28 ** | 47.5 (38.5) | < 0.001 |
| 2013: IV days, median (IQR) | 0 (0-7) | 14 (0-26) | 14 ** | 43 (17-69) | 0 ** | 13 (0-14) | 28 ** | 28 (14-64) | |
| 2014: number of adults with CF | 10 | 23 | 1 | 21 | 2 | 12 | 1 | 18 | |
| 2014: IV days, mean (SD) | 8.0 (11.9) | 10.4 (12.1) | 35 ** | 30.3 (22.5) | 7.0 (9.9) | 23.4 (22.2) | 14 ** | 46.5 (34.7) | < 0.001 |
| 2014: IV days, median (IQR) | 0 (0-15) | 10 (0-14) | 35 ** | 25 (14-47) | 7 ** | 16 (14-32) | 14 ** | 41 (14-70) | |

[IV use by group **Unable to calculate SD / IQR]

Those with worsening FEV1 / increasing IV days resulting in worsening of their clinical subgroup from 2013 to 2014 (n=16) have lower adherence in 2013 compared to those who remained stable / improved (n=71); mean 22% (95% CI 12-33%) vs 40% (95% CI 33-47%), p-value 0.007.

Conclusion

Nebuliser adherence is an important modifiable risk factor for high IV use. Those with high IV use may benefit from better nebuliser adherence.