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Abstract Details

PRESENTATION TYPE: Poster

CURRENT CATEGORY: EPIDEMIOLOGY & NEWBORN SCREENING

KEYWORDS: FEV₁, Registry, epidemiology, quality improvement, care improvement.

AWARDS:

Abstract

TITLE: UNDERSTANDING FEV₁ FOR THE PURPOSE OF CF REGISTRY COMPARISONS: DOES BIAS IN ANNUAL REVIEW FEV₁ AFFECT BETWEEN-CENTRE COMPARISON WITHIN THE UK?

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ABSTRACT BODY:

Abstract Body: Background

Our earlier abstract using the 2014 UK CF registry data from adult centres showed that a funnel plot of annual review %FEV₁ adjusted for case-mix factors identified 4 small centres & 2 large centres as negative outliers and 1 medium-sized centre as a positive outlier. The funnel plot also suggests that an inverted U-shape relationship exists between %FEV₁ and centre size.

In another abstract, we showed that annual review %FEV₁ under-estimated lung health of adults in comparison to %FEV₁ captured during periods of clinical stability. This has clear implications when comparing against registries with encounter-based FEV₁, such as the US.

However, it is uncertain whether the bias in annual review %FEV₁ also affects between-centre comparison within the UK.

Aim

To determine whether discrepancies between annual review FEV₁ and best annual FEV₁ vary according to centre size and thus affect the between-centre differences observed in a funnel plot analysis

Methods

Adults who had lung transplantation were excluded. Adult CF centres in the UK with ≥80% completeness for best FEV₁ data in 2014 were included in this analysis.

Mean discrepancy between annual review and best annual %FEV₁ were plotted against centre size. A Local Polynomial Regression (LOESS) curve was used to explore the relationship between the two variables. An appropriate model is fitted based on the LOESS curve to determine the strength of relationship between discrepancies in %FEV₁ vs centre size.

Results

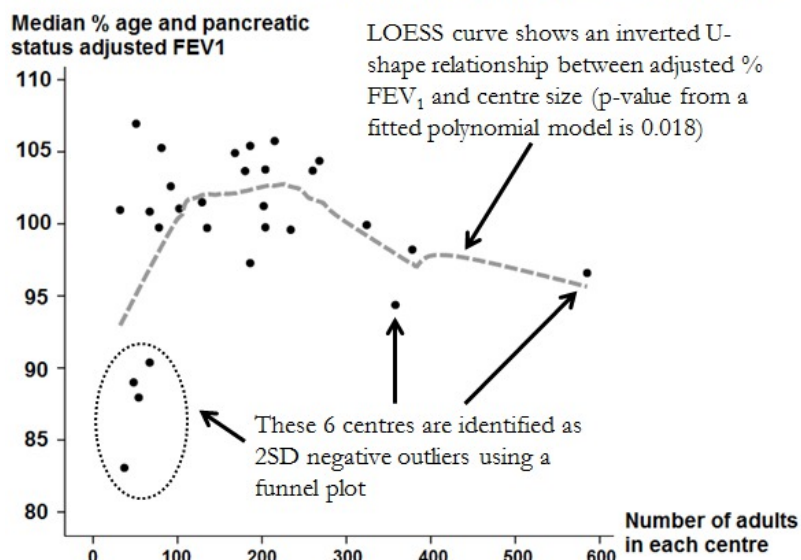
Of the 28 adult centres in the UK, 18 centres have ≥80% completeness for best FEV₁ data in 2014. There is an inverted U-shaped relationship between mean discrepancies in %FEV₁ and centre size, which is statistically significant (p-value 0.048 with a fitted polynomial model).

Conclusions

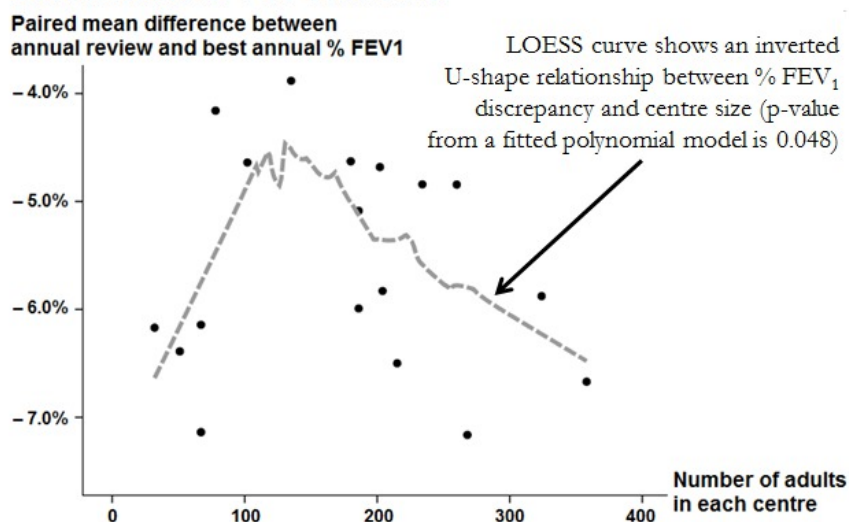
Annual review %FEV₁ under-estimated lung health of adults from small and large centres in the UK to a greater extent compared to adults from medium-sized centres. This suggests that the between-centre differences observed in a funnel plot could be exaggerated by systematic bias in annual review %FEV₁. As such, annual review %FEV₁ is an unreliable metric to compare health outcomes of adult CF centres within the UK using a funnel plot.

(no table selected)

Graph of median case-mix adjusted FEV1 vs centre size



Graph of mean discrepancy between annual review and best annual FEV1 vs centre size



In a funnel plot, the outcome of interest is plotted against centre size.

The Local Polynomial Regression (LOESS) curve is a non-parametric method for fitting smooth curves to empirical data, to depict relationships between variables. For reference, see:

Cleveland WS, Devlin SJ. Locally weighted regression: an approach to regression analysis by local fitting. *J Am Stat Assoc* 1988; 83: 596–610.

Caption: