
Article:
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REGARDING THE ARTICLE ENTITLED "EFFECT OF ELEXACAFTOR/TEZACAFTOR/IVACAFTOR ON ANNUAL RATE OF LUNG FUNCTION DECLINE IN PEOPLE WITH CYSTIC FIBROSIS"

Running title:

Regarding the article on the effect of ELX/TEZ/IVA

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Dear Editor,

Lee et al [1] compared participants of ELX/TEZ/IVA clinical trials aged ≥12 years against 2012-2017 controls in the US CF Foundation Patient Registry. An annual ppFEV$_1$ trend of +0.39 (95% CI -0.06 to +0.89) for ELX/TEZ/IVA treated participants contrasted with -1.92 (95% CI -2.16 to -1.69) for controls. They concluded that ELX/TEZ/IVA is the first CF therapy that halts FEV$_1$ decline over a 2-year follow-up period, which included phases of lockdown/shielding due to the Covid-19 pandemic. The use of non-contemporaneous controls was suggested to have limited impact on the finding because a sensitivity analysis showed consistent results for 2012-2014 and 2015-2017 controls, and impact from Covid-19 lockdown/shielding on FEV$_1$ trend was unknown.

However, a recent Australian CF registry analysis [2] found an improvement in the annual ppFEV$_1$ trend from -0.13 (95% CI -0.36 to +0.11) to +1.76 (95% CI +1.46 to +2.05) during the Covid-19 pandemic among a largely CFTR modulator naïve population (only 0.4% on ELX/TEZ/IVA). A limitation is the inclusion of home spirometry readings during the Covid-19 pandemic. A previous study comparing FEV$_1$ trends for home versus clinic spirometry found a lack of precision with home spirometry but similar magnitude of FEV$_1$ trend [3]. If the Australian results are generalisable, contemporaneous controls not on ELX/TEZ/IVA may also have stable FEV$_1$. Recruitment for NCT03525444 and NCT03525548 trials commenced in June and August 2018, whilst the US lockdown started in March 2020 [4]. Therefore, all ELX/TEZ/IVA treated participants with 24-month follow-up had 3-13 months of their FEV$_1$ data collected during the Covid-19 lockdown, unlike the historical controls from 2012-2017. This may bias the analysis by Lee et al [1] in favour of ELX/TEZ/IVA treated participants.

Newsome et al [5] have previously pointed out bias in using historical cohorts as control groups to estimate the treatment effect of CFTR modulators. This is particularly problematic if the treatment follow-up coincided with Covid-19 pandemic which may be associated with a substantially improved FEV$_1$ trend even among people not using ELX/TEZ/IVA, probably from reduced exposure to respiratory viruses and a reduction in pulmonary exacerbations [2]. In estimating the treatment effect of ELX/TEZ/IVA, it may be more appropriate to use negative control outcomes combined with difference-in-differences analysis as proposed by Newsome et al [5] instead of comparison against historical cohorts. Longer-term follow-up of ELX/TEZ/IVA treated participants in the post-Covid epoch is also important, as people with CF start returning to their pre-pandemic lifestyle.

COMPETING INTERESTS

None declared.

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