The Leeds Teaching Hospitals NHS Trust

Association of baseline characteristics and care processes with visual acuity outcomes after 12 months of treatment in 9,401 eyes with neovascular AMD.

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Aims: To record visual acuity outcomes after 12 months of treatment for neovascular age-related macular degeneration (NvAMD), investigate variation in outcomes between treatment sites and explore association with baseline characteristics and key care processes

Methods: This project was approved by the University of Leeds Medicine and Health Faculty Research Ethics Committee (MREC 19008). Prior to data extraction, written approvals from both the medical retina lead and Caldicott Guardian (responsible for data protection) were obtained at each site.

Anonymised demographic and clinical data, collected as part of routine care, were extracted from the Medisoft EMR at collaborating NHS treatment sites. Age at the start of treatment, sex, any systemic or chronic ocular co-morbidity and first or second treated eye status were recorded for all patients. Index of multiple deprivation, an indicator of socioeconomic status, and assisted or independent living status were determined from the first half of and the full patient postcode respectively at the time of data extraction. Completion of the loading phase of 3, monthly injections was classified as fast (≤8 weeks), medium (9-10 weeks), slow (>10 weeks) or incomplete.

Analyses were restricted to eyes with visual acuity recorded at the start of treatment and after 12 months. The proportion of eyes with "good" (LogMAR ≤ 0.3 or ≥ 70 ETDRS) and "poor" acuity (LogMAR >1.0 or < 30 letters) was determined for each site, identified by the letters A-M. Associations with acuity outcomes were investigated using multivariate linear and logistic regression.

Results: Analyses included 9,401 eyes of 7,686 patients starting intra-vitreal therapy for NvAMD at 13 NHS Trusts in 2017/18. From baseline to month 12, median acuity improved from LogMAR 0.50 (interquartile range: 0.30, 0.80) to 0.40 (IQR: 0.22, 0.74). Median visual acuity change to month 12 was LogMAR -0.06 (IQR: -0.2, 0.1) and varied from LogMAR -0.1 (Sites B, C, F) to LogMAR 0.0 (Sites K and L).

Figures: Impact of time to complete the loading phase of treatment (relative to "fast") and site (relative to site A) on visual acuity outcomes at month 12.

Figure 1:

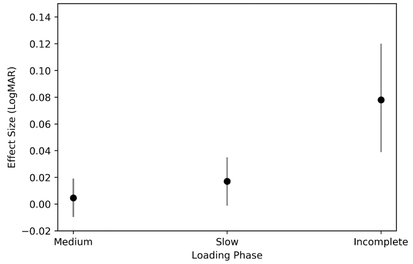
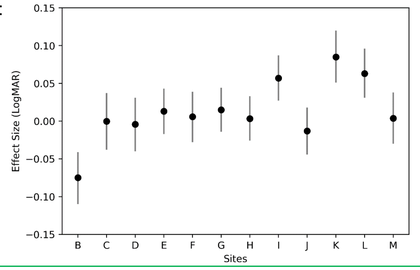


Figure 2:



Results (continued): The proportion of eyes with "good" visual acuity increased from 34.5% at baseline to 39.8% at month 12. Between sites, the proportion with "good" acuity at month 12 varied from 30.8% (site A) to 52.9% (site B). Overall, 40.9% of eyes gained at least 0.1 LogMAR in acuity and 90.5% avoided losing at least 0.3 LogMAR.

Baseline visual acuity was the strongest predictor of visual outcome at 12 months. For each LogMAR 0.1 worsening of baseline acuity, 12-month acuity outcomes improved by LogMAR 0.074 (95% CI: 0.073, 0.074) but the odds ratio for a "poor" acuity state was 1.66 times higher (95% CI: 1.61, 1.70).

Younger age, independent living status and lower socio-economic deprivation were also associated with better acuity outcomes. Incomplete or slow completion of the loading phase of treatment (see Figure 1) and fewer injections were associated with worse acuity outcomes.

Despite case-mix adjustment, there was evidence of significant variation in outcomes between sites. (See figure 2) Compared to the reference, site A, treatment at site B was associated with an improvement of -0.075 LogMAR (95% CI: -0.11, -0.041) at month 12, while treatment at site K was associated with a decrease of 0.085 LogMAR (95% CI: 0.051, 0.12). Similarly, compared to site A, the odds ratio for a "poor" outcome increased at 3 other sites, namely I, K and L. For site B, with the best outcomes, the odds ratio for a "poor" acuity state reduced to 0.44 (95% CI: 0.32, 0.60).

Conclusions: Even after adjustment for other variables, including baseline acuity, variation in acuity outcomes exists between NHS treatment sites. Meaningful comparison of outcomes between sites requires adjustment for a range of baseline characteristics, not visual acuity alone.

Timely completion of anti-VEGF loading dose and a higher number of anti-VEGF injections were associated with better outcomes. Identifying best treatment practice at sites with better outcomes and adapting local care processes are required to tackle this health inequality.

Acknowledgements: F. Hoffmann-La Roche Ltd., Basel, Switzerland, provided financial support for the study and participated in the review and approval of the abstract for this poster.

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