BACKGROUND

AMD is a leading cause of visual loss that affects nearly 10% of the global population aged 50 years and older. The risk of severe vision loss increases as AMD progresses, with advanced AMD characterized by the loss of visual function, known as advanced dry AMD, with geographic atrophy (GA) or, by the presence of sub-foveal choroidal neovascularization (CNV) known as wet AMD. 

A range of studies have assessed visual function loss in dry AMD (B1)–(B4), but the consequences of dry AMD on visual function and visual impairment have rarely been evaluated in dry AMD. 

• GA is that part of the foveal center containing photoreceptors, which can limit visual functioning without impairing VA.

METHODS

• We reviewed all types of studies:
  • AMD utility studies, which were included in a published review of utilities in ophthalmology (E1–E4).
  • AMD economic modeling studies, which were included in a published review of cost-effectiveness (E5–E12) or to NICE (E13–E14) for published economic evaluations of dry AMD therapies were found.

The selected studies were compared with two guideline-based visual impairment definitions: Moderate Visual Impairment (E5–E6) and severe visual impairment (E7). The selected studies were assessed in terms of their suitability for use in cost-effectiveness modeling (E8–E10) and their potential for ongoing clinical trials in dry AMD.

The size, location, and pattern of GA growth are important in considering the visual loss associated with dry AMD.

Wet AMD severity levels (only considered in Aspinall et al. [2007]) included very mild, mild, moderate, and severe levels. 

CONCLUSIONS

The visual acuity loss in dry AMD is not well established compared to dry AMD models.

RESULTS

• From the selected studies, our review found:
  • The utility studies looking at patients with AMD were conducted at least 10 years ago, with utilities most commonly used in published economic models coming from a TTO study conducted more than 15 years ago.
  • Aspinall et al. [2007] found that utility values generally decreased as VA worsened; the absolute utility values and the range of utility values across VA levels were remarkably consistent across utility methodologies and studies.
  • Composed of four alternative methodologies (SF-6D, HUI-3, VAS, and TTO), the TTO utilities reviewed by Brown et al. [2000] showed the greatest range between 0.61 and 0.94 (0.40 for the (B1–B5) compared to 0.57 (E4)–0.64 (E5)–0.77 (E6)–0.80 (E7)–0.93 (E8)–0.94 (E9)–0.95 (E10)–0.97 (E11)–0.98 (E12) for the TTO utilities.

Each of the modeling studies considered used health states defined by VA ranges. The only CE study considering a VA level in visual function was by Rutten et al. [2001] who compared a model structure based on CE levels with traditional VA-based model structure.

What sources were used for the utility values?

• If VA-based utility values were used, how did the VA ranges used in the model compare with the ranges in the relevant utility studies?

• A comprehensive overview of AMD levels grouped as dry AMD or wet AMD with drusen as an outcome and as Large drusen (61-100 microns) and Medium drusen (10-60 microns) are important in considering the visual loss associated with dry AMD.

OBJECTIVE

• To assess the suitability of publicly available VA-based utilities used in wet AMD economic models and their suitability for use in cost-effectiveness models in age-related macular degeneration (AMD) in use in economic evaluations in dry AMD.

The CE analysis described in NICE (2012) used utilities from a study that simulated AMD health state in individuals drawn from the general population.

• Only two of the utility studies considered non-VA measures of visual functioning:
  • Espallargues et al. [2005] reported TTO, VAS, SF-6D, HUI-3, and EQ-5D utility values for four levels of CS and for four levels of the Visual Function Index (VF-14); founding that all utility values of visual functioning consistently decreased with worsening visual function across all methodologies except for the EQ-5D.
  • While Aspinall et al. [2007] did not report specific utility values based on visual functioning, better clinical outcomes were associated with higher TTO utility in their study.

• In the only analysis considering the interaction of VA and visual functioning, Espallargues et al. [2005] found that TTO utility values decreased with worsening CS even after controlling for VA.

While each of the utility studies included patients with dry AMD, the analyses were of limited usefulness for economic evaluations of new treatments for dry AMD.

In the studies, the percentages of patients with dry AMD were either not reported or were true (367 out of 272 (13%) with dry AMD only) by Espallargues et al. [2005].

• Dry AMD severity levels (only considered in Aspinall et al. [2007]) were not aligned with AMD clinical trial populations, which are restricted to patients with GA (with or without sub-foveal involvement) and/or in active or prior history of CNV.

• In the only study looking at the effect of the type of AMD on utility, Aspinall et al. [2007] found that the type of AMD severity and the definition of AMD severity did not differentiate between dry and wet AMD. These limitations prevent drawing definitive conclusions about the applicability of wet AMD utility values in patients with advanced dry AMD.

CONCLUSIONS

Stated limitations and inconsistencies were observed in utility values for wet AMD, and key data gaps were identified in relation to dry AMD.

• Studies designed specifically for dry AMD that account for the features unique to advanced dry AMD with GA are needed to support economic evaluations of future dry AMD therapies.

REFERENCES


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