Photodynamic Therapy: Current Guidelines for the Management of Neovascular Age-Related Macular Degeneration

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Core Messages

- Efficacy and safety of photodynamic therapy (PDT) have been evaluated in prospective, randomized, clinical trials in patients with choroidal neovascularization (CNV) secondary to AMD
- PDT in predominantly classic CNV is a reasonable treatment for all lesion sizes ≤5400 µm
- In minimally classic CNV, lesions smaller than four MPS disc areas should be treated
- In occult with no classic CNV, lesions smaller than four MPS disc areas should be treated if there are signs of recent disease progression
- Standard treatment parameters have been used for patients with CNV due to causes other than AMD

8.1 Introduction

In recent years, numerous prospective trials have addressed the efficacy and safety of photodynamic therapy (PDT) with verteporfin (Visudyne, Novartis). They have shown that PDT leads to an improved visual acuity outcome in patients with various manifestations of age-related macular degeneration (AMD) with subfoveal choroidal neovascularization (CNV) [1, 3, 6, 9, 14, 22, 23]. Further analyses revealed specific factors and characteristics with an impact on the subsequent clinical course including composition and size of the lesion [6, 11]. The aim of this review is to summarize the relevant results of these studies in order to develop an efficient and precise strategy for the use of PDT. Additional information from pilot series has extended our knowledge of the response that CNV has to PDT.

8.2 Efficacy of Photodynamic Therapy

8.2.1 Efficacy of PDT: Predominantly Classic CNV

The TAP (*T*reatment of *A*MD with *P*hotodynamic Therapy) study [9, 22] was a randomized, multicentre (North America and Europe), double-masked and placebo-controlled trial in patients with some evidence of classic subfoveal CNV. Patients in the treatment arm were given an infusion of verteporfin (6 mg/m²) intravenously over 10 min. Fifteen minutes after the start of infusion, a laser light at 689 nm delivered 50 J/cm² at an intensity of 600 mW/cm² for 83 s using a spot size with a diameter 1000 µm larger than the greatest linear dimension (GLD) of the lesion. The baseline visual acuity had to be 20/200 or better and the lesion GLD had to be 5400 µm or less.

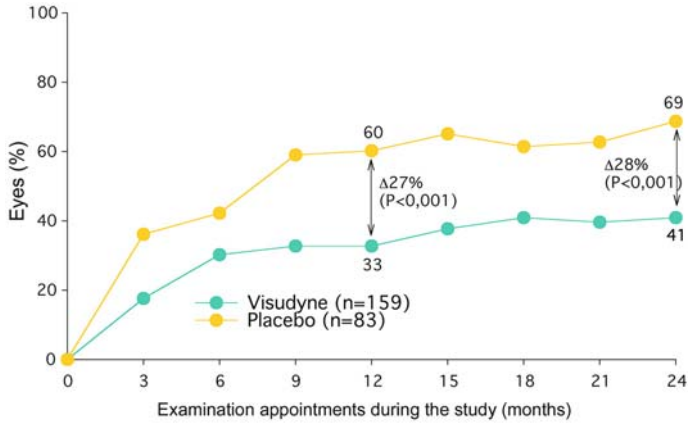

Fig. 8.1. Eyes with visual acuity loss ≥3 lines in patients with predominantly classic CNV in the TAP study

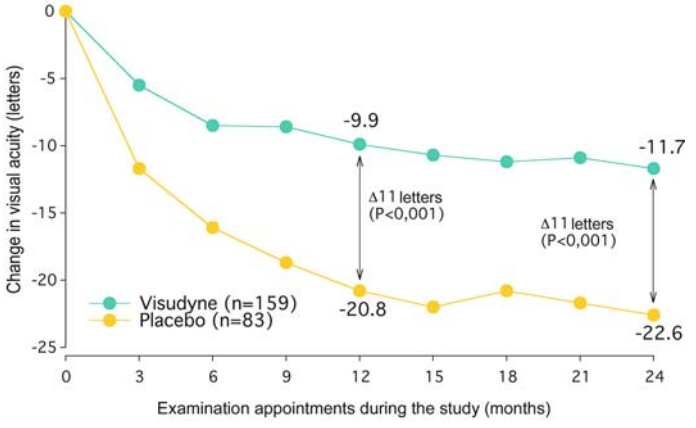

Fig. 8.2. Mean visual acuity change (Δ letters) in patients with predominantly classic CNV in the TAP study

Patients were followed at 3-month intervals for a total period of 24 months, and were re-treated if they showed leakage during fluorescein angiography. Out of 609 patients included in the study (PDT group 402, placebo group 207), 159 patients in the PDT group and 83 patients in the control group had predominantly classic CNV. Moderate visual acuity loss (defined as a loss of 15 or more letters, which is 3 or more lines, of ETDRS acuity) was seen significantly more often in patients in the untreated control group than in a group treated with PDT (PDT group 41 % versus placebo group 69 %) (Fig. 8.1). The mean loss in visual acuity, measured in letters on an ETDRS chart, was significantly less in the PDT group than in the control group at the end of the follow-up period (PDT group – 11.7 letters versus placebo group – 22.6 letters) (Fig. 8.2) [1, 23]. In patients treated with PDT, the probability of a severe vision loss (≥6 lines or 30 letters) was also significantly lower than in the placebo group (PDT group 15.1 % compared to 36.1 % in the placebo group at the end of the trial). Patients undergoing PDT had significantly less loss of contrast sensitivity over the 24 months, with a mean loss of 0.2 letters, compared to 6.4 letters in the placebo group [14].