The Royal College of Ophthalmologists
Maximising Capacity in AMD Services
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Neovascular (wet) age-related macular degeneration (AMD) is a serious macular disorder resulting in progressive loss of central vision. In the United Kingdom, wet AMD accounts for more than half of all cases of registered severe sight impairment (blindness) and sight impairment. It is estimated that there are 40,000 new cases of wet AMD each year in the United Kingdom currently, and that the incidence will continue to rise with the ageing population.[1]

AMD Services have continued to expand following the introduction of contemporary treatments for neovascular AMD such as the intravitreal injection of anti-VEGF agents. The workload associated with such treatments including the necessary frequent follow-up of patients is substantial. The staffing of these clinics, in some departments is also well below the expected levels. This is evident in a recent VISION 2020 UK Macular Interest Group Survey. Some eye departments have been unable to recruit medical staff, especially middle grade doctors, either because of inadequate funding of services or inability to recruit to the required specifications. The pressure on resources and service delivery in the AMD clinics will become even more intense as we are unable to discharge patients, but have to accommodate all the new ones. The regular monthly follow up for AMD patients under treatment in order to maintain efficacy is demanding. This situation is likely to be further aggravated by the implementation of NICE recommended treatments of retinal vein occlusions and some diabetic retinopathies with intravitreal therapies. As such the problem seems more acute than was originally envisaged, and will get worse.

Whilst it is thought by a minority that the bottleneck is with the intravitreal drug delivery, the majority of AMD specialists agree that the capacity problem is due to the increased and recurrent long term follow-up clinic visits required for these patients; some continue to receive treatment 5 years after NICE TA 155 implementation. The ideal solution would be the employment of more consultant or middle grade ophthalmic medical staff in these clinics. However the recruitment of middle grade doctors in ophthalmology has been problematic.

It has been suggested that in the absence of adequate ophthalmic medical manpower to fully staff AMD services, the potential of engaging non-medical staff (optometrists, nurses, technicians) to undertake some of the duties in the AMD clinics should be explored. Such roles may include clinical assessments, especially re-treatment decision making, and intravitreal drug delivery. Modelling (using national averages) indicates that the number of clinical assessment appointments drives the need for increased capacity rather than the number of intravitreal injection appointments. However, some ophthalmologists feel that the bottleneck lies directly with the intravitreal injections. If this is correct the workload would be contained if intravitreal injections were undertaken by trained technicians/nurses.

Potential solutions

As individual wet AMD provider services differ in their structure, size, and patient population, as well as in the specific limitations of the service, it is unlikely that one single solution will be suitable for every service provider. A combination of potential solutions may be suited for different clinics, some of which are summarised in Action on AMD.[2]
The suggested solutions include:

i) Widening the network of AMD service provision. This involves opening up the treatment of AMD to general ophthalmic departments and non-retinal specialists.
ii) Clinical assessments and evaluation of images be undertaken by trained optometrists/nurses under the supervision of a retinal specialist with expertise in AMD.
iii) Intravitreal injections be undertaken by trained non-medical health care professionals (HCPs) including technicians/nurses.
iv) Follow-up clinics in the community manned by optometrists.

The first option seems inappropriate as, amongst other things, it will draw resources away from other ophthalmic services e.g. general ophthalmic services, and services for cataract and glaucoma. Some 're-training' of clinicians may be required as well if non-medical retinal specialists are to contribute to AMD services.

Clinical assessment by non-medical personnel in ophthalmology has been tried for a long time in the UK, particularly in the field of glaucoma. Some AMD clinics in the UK have adopted schemes based on the glaucoma model. As an example, one consultant specialist can oversee a clinic where up to 45 patients with AMD are evaluated and treated if necessary by the consultant and other doctor in the same clinic. This is made possible by the use the trained optometrists each undertaking slit lamp (including fundus) examinations, undertaking and interpreting OCTs in set rooms whilst the consultant moves from room to room making decisions. Data is all entered into an electronic system prior to the arrival of the consultant in a particular room. Images and clinical information are reviewed to allow decisions. This model requires the availability of multiple consulting rooms and ready access to OCT imaging. Audit of several such schemes have indicated that specifically trained optometrists are capable of providing safe and efficient AMD clinics, and can deliver safe and effective 'Stable AMD Service' in a hospital setting.[3]

Virtual clinics or patient management pathways with different variations have been implemented by several providers. Images (colour fundus photographs and OCT) are obtained from patients. The images are reviewed subsequently by a clinician or other trained personnel who makes management decisions. Examples of such models are provided in Action on AMD.[2]

Attention needs to be paid to appointment schedules so that patients who attend 2-stop clinics are not unduly disadvantaged by extensions to their treatment intervals. It is also important that irrespective of which category of staff delivered these services, there are adequate numbers in place to cover for planned and unplanned absences.

The option of intravitreal drug delivery by HCP staff may have some attraction. Irrespective of its 'simplicity' intravitreal drug delivery is still invasive. Such simplicity will not necessarily apply to other treatments with dexamethasone implants *(Ozurdex)* and slow release anti-VEGF implants if they become available.

The use of HCPs to deliver intravitreal injections started in Copenhagen. There are areas in the UK which have introduced such a scheme already. The process will require careful planning and training followed by monitoring and audit. Intravitreal injections are straight forward if

undertaken by someone who knows what they are doing. There must be consultant supervision so that advice can be sought easily, particularly if there is a need to manage complications. It will take time to train and assess their competencies. The Professional Standards Committee (PSC) of the College has given guidance on intravitreal injections being undertaken by HCPs.[4]

Community follow-up of previously treated and stable AMD patients may also reduce the burden on hospital based AMD clinics, and will also bring services into the community, closer to patients. In such a scheme, patients previously treated for wet AMD, but who have been stable for 6 months or more consecutively (who have not required any treatment for 6 months of regular clinic follow-up) may be referred for subsequent follow-up in a community setting manned by trained optometrists, under the supervision of a medical retina specialist. Such a clinic must be fully equipped to undertake clinical examination, OCT and colour fundus photographs. There must be facilities for secure online referrals or information transmission for managed referral back into the AMD clinic for those who require further treatment. Such a scheme has been piloted in Bolton and Salford.[2,5]

Such community optometrist follow-ups face the problems of training optometrists, duplication of equipment provision, image transmission to the AMD Clinic for virtual analysis, and or managed referral back into the AMD clinic for those who require further treatment with the attendant logistical problems. The supervising ophthalmologist needs adequate time in his/her job plan to oversee the service. With adequate training, resources, and supervision by a clinician with expertise in the management of AMD such schemes may be effective.

In a variation of this scheme, assessments are undertaken by trained optometrists/nurses working as part of a team or network under the supervision of a medical retinal specialist in the community as well as the hospital. Patients who are stable low risk or ‘low chance’ of requiring treatments are followed-up in a community setting under supervision. This scheme allows for patients to be treated, or sent back into the hospital immediately as and when required. The East Yorkshire scheme provides an example.[6]

Despite difficulties with the recruitment of middle grade doctors, intravitreal drug delivery by doctors is still the preferred practice. It is also envisaged that there may be a reversal in medical manpower shortage in the near future when the expanded cohorts of medical students (including graduate entry students) join the ophthalmic workforce.

Recommendation

Each unit should put in place a service model which allows patients with neovascular AMD to receive timely and effective treatment with optimal follow up. The model may vary depending on the local circumstances. Several examples of good practice and service development in neovascular AMD exist and can be drawn upon to help services meet the recommended quality of care and achieve best possible outcomes for patients.

References

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Declarations
Winfried Amoaku currently chairs the VISION 2020 UK Macular Interest Group. He is a member of the Scientific Research Committee of the Macular Diseases Society. He has received educational travel grants from Allergan, Bayer, Novartis, and served on Advisory Boards for Alimera, Allergan, Bayer, Novartis, and Pfizer for which he has received honoraria. He has participated in clinical trials sponsored by Allergan, Novartis, Pfizer, and Bausch and Lomb, for which his institution has received funding. His institution has also received research grant funding from Allergan and Novartis. He has received lecture fees for speaking at the invitation of Allergan, Bausch and Lomb, Novartis and Pfizer.