An audit of the Uveitis Service within NHS Greater Glasgow and Clyde facilitated by the use of a novel unstructured data-mining tool

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Introduction

The process of clinical audit is central to good practice, both for proving the value of a service and ensuring patient safety.

We wished to audit our clinical practice with regards to the management of patients with sight-threatening uveitis receiving systemic immunosuppression. Specifically, we wanted to look at:

- Visual outcomes
- Systemic complications
- Prednisolone prescription

The lack of a patient database or electronic patient record is a stumbling block in pursuing clinical audit. Recently, the Medical Devices Unit within NHS Greater Glasgow and Clyde (NHS GGC) have developed an unstructured data-mining tool (uDMT). This uDMT allows clinic letters from existing clinical applications (Clinical Portal) to be searched for relevant terms. Data produced is stored in a structured database, mapped to the patient Community Health Index (CHI) number.

The uDMT has been previously used within NHS GGC to successfully audit Age Related Macular Degeneration treatments and outcomes. If an uDMT can be proven successful in creating a database suitable for clinical audit, it may offer significant advantages over existing laborious methods of prospective data collection in clinic or retrospective manual review of clinical letters.

Study Aims

Our study aimed to create a database of patients attending the uveitis service on systemic immunosuppression, and to subsequently audit patient management and outcomes.

Methods

The uDMT was instructed to search through clinical letters on Clinical Portal from six outpatient uveitis clinics across four sites within NHS GGC. We set the search criteria as Mycophenolate, Tacrolimus, and Adalimumab. The study period was one year from 01/03/2017 to 28/02/2018.

All patients identified as fitting these criteria subsequently underwent review of their clinic letters during the study period and the following data manually extracted:

- Age
- Gender
- Best-corrected visual acuity (EDTRS)
- Immunosuppressive therapy and whether they were on therapy for more than 12 months
- Prednisolone dose at end of study period
- Hospital admissions for non-ocular related disease during an extended 5 year study period between 01/03/2015 and 01/03/2020. This was later shortened to 21/01/2020 due to the changing nature of admissions during the Covid-19 Pandemic.

Patients for whom complete data could not be ascertained were excluded from the study.

Patients who were identified by the search criteria but subsequently found not to be on immunosuppressive therapy were excluded from further analysis.

Results

The uDMT identified 152 patients taking one or more of the three second line immunosuppressants. Manual data collection was successful in 147 patients. 5 were excluded from analysis due to incomplete data. The following graphs look at the nature of immunosuppressive regimens amongst patients in our study.

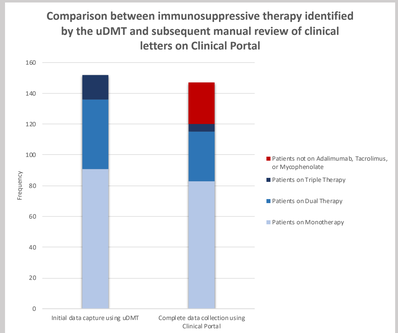


Figure 1.1: 152 patients identified by UDMT on one or more of study drugs. Manual data collection completed for 147 patients, 27 patients found to not be on immunosuppressive therapy excluded from further analysis.

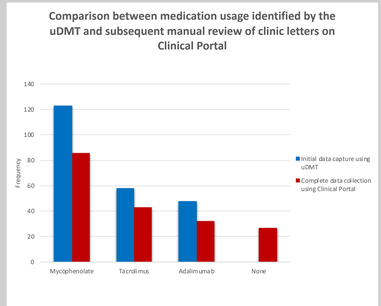
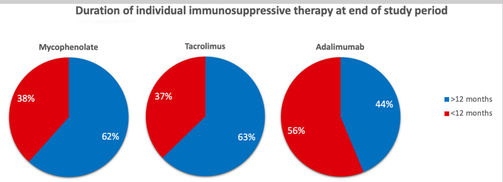


Figure 1.2: : 30.1% patients identified by the uDMT as being on Mycophenolate were found not to be prescribed the drug. Error for Tacrolimus 25.9%, and Adalimumab 33.3%. This error was related to medications mentioned in clinical letter but not commenced.

Figure 1.3: The majority of patients taking Mycophenolate and Tacrolimus had been established on the therapy for more than 12 months. The proportion of patients established on Adalimumab for more than 12 months was lower.



These graphs show a demographic profile of our patients: distribution of age, gender, and visual acuity.

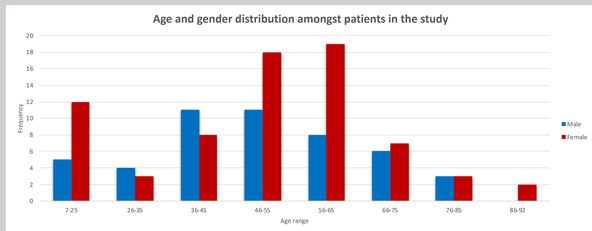
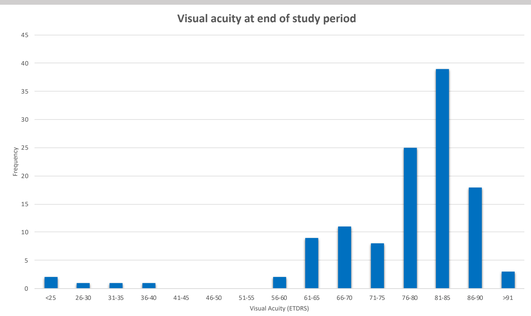


Figure 2.1: 120 patients were in the study group. Their ages ranged from 7 to 92, with a mean age of 49.5. 60% of patients were female (n=72).

Figure 2.2: Mean binocular visual acuity 78.6 ETDRS letters. 22.5% (27 patients) had binocular acuity <70 letters; 4.2% (5 patients) <50 letters.

For patients <50 EDTRS letters: 2 patients CNV, improved with anti-VEGF; 1 corneal scarring; 2 macular atrophy



Results (Continued)

Finally, Figure 3.1 examines prednisolone prescribing and Figure 3.2 systemic complications of immunosuppressive therapy. Without normative population data it is not possible to ascertain if the 24 infection-related admissions and malignancies were directly related to immunosuppressive therapy.

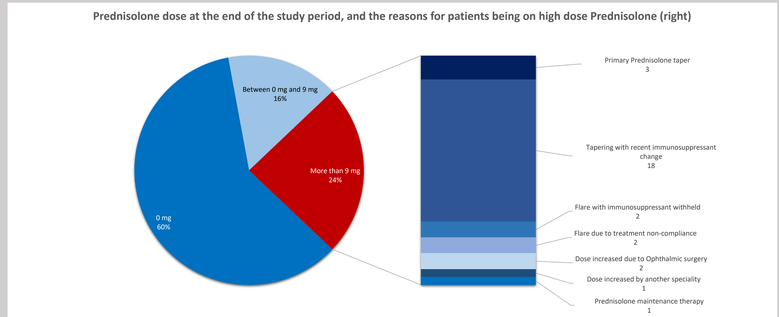


Figure 3.1: Prednisolone dose at end of audit period: 60% 0mg; 16% <9mg; 24% >9mg. Only one patient on maintenance >9mg; all other patients on reducing regimen

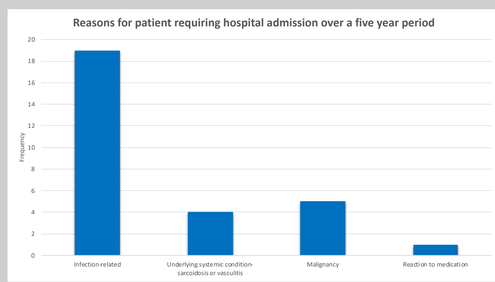


Figure 3.2 During the 5 year period 2 patients had definite treatment-related admissions, 1 with EBV-lymphoproliferative disorder which resolved on stopping MMF and 1 had a 'drug reaction' to adalimumab. 4 patients required admission as their underlying systemic disease, either vasculitis or sarcoidosis, was not adequately controlled.

Conclusions

- Although the uDMT has not be proven to identify all appropriate patients, in our study it was a useful tool in identifying specific patient groups and expediting the labour-intensive data collection process.

- For the first time, we have a demographic profile of patients attending our Uveitis service and data to show our prescribing practice of second-line immunosuppressive therapy in uveitis patients is safe, well tolerated, and with a relatively low risk of systemic complication and good visual outcomes.

References

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