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Stewardship: it's going viral

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SUMMARY

Introduction: Historically, antimicrobial stewardship (AMS) has considered the judicious use of antibiotics. AMS is widely adopted across Europe and the US; recently antifungal AMS is gaining momentum but antiviral AMS has been little described. Here we describe the introduction of AMS virology reviews at University Hospitals Birmingham (UHBFT); a novel concept and an opportunity to broaden the beneficial aspects of AMS to virology, termed anti-viral stewardship (AVS).

Method: In June 2022, a UK supply issue with aciclovir injection (ACV IV) was announced. In order to review and preserve parenteral ACV for those in greatest need, UHBFT pharmacist and virologists implemented a specialist review for patients prescribed more than 48 hours of treatment. This review initially lasted 10 weeks and data was collected on the advice offered, whether it was accepted, and time required completing the review.

Results: AVS rounds halved IV ACV consumption, compared to pre or post intervention levels, with more than half of patients advised to stop or switch to oral therapy. Diagnostics and sampling guidance was offered in one quarter of reviews, whilst the remaining interventions were more stewardship focused. In almost all cases stewardship advice was readily accepted by clinical teams. Due to positive feedback from clinicians and its effective management of supply, the anti-viral stewardship (AVS) programme was re-introduced in June 2023.

Conclusions: Antiviral AMS rounds provide an opportunity to optimise sampling, diagnosis and improve patient management. Introduction of regular AVS at UHBFT are now well established and plan to be implemented in other hospitals.

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Background

Worldwide, Antimicrobial Stewardship Programmes are well established organisational initiatives with an objective of improving the prescribing and use of antibiotics by clinicians and patients. The overall aim of stewardship is to preserve the

activity of antimicrobials by optimising patient therapy and reducing unnecessary exposure, thereby minimising the opportunities for the development, and spread of resistance. Additionally, an important facet in stewardship includes the appropriate conversion of intravenous (iv) to oral therapies which has been demonstrated to offer numerous patient

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benefits, is cost-effective and can have a beneficial impact on the nursing workforce capacity. [1]

Antibiotic Stewardship Programmes (ABSP) came to prominence in the last 25 years and a recent systematic literature review by *Ababneh et al.* showed that hospital ABSP can reduce total antibiotic consumption by 19% and the use of the broadest spectrum agents by 27%. [2] More recently interest has spread to antifungals and the potential for stewardship interventions in the management of fungal infections. Antifungal Stewardship Programmes are often less mature than ABSP however several papers have presented data demonstrating improvement in diagnosis and antifungal management following implementation. [3,4].

University Hospitals Birmingham (UHBFT) is a large acute NHS Hospital Trust with approximately 2600 in-patient beds including specialist beds for solid organ (renal, liver, heart, and lung) transplantations, bone marrow transplantation, infectious diseases, and acute medicine. Parenteral antivirals are frequently used in the empirical management of acute neurological presentations to the Emergency Department, as well as in the focused management of infections in transplantation populations.

Antibiotic stewardship is long established at UHBFT and following implementation of an antifungal stewardship programme which demonstrated a 32% reduction in expenditure [5] an Antiviral Stewardship (AVS) programme was developed to review aciclovir injection (ACV IV) usage at UHBFT; a novel concept and an opportunity to broaden the beneficial aspects of AMS to virology.

In July 2022, a national supply issue with ACV IV was announced. To review and preserve ACV IV for those in greatest need, UHBFT pharmacists and virologists implemented an AVS programme which comprised twice weekly (Tuesdays and Fridays) antiviral ward rounds in which the multi-disciplinary team (made up to a consultant virologist, specialist pharmacist and specialist clinical scientist/registrar) reviewed all in-patients who had prescribed ACV IV for more than 48 hours. The advice offered by the team was grouped into themes and categorised as follows: stop, continue, intravenous to oral switch (IVOS), dose modification, or sampling and diagnosis.

Supply of ACV IV returned during September 2022 and consequently AVS reviews stopped. However, due to positive feedback from clinicians and successful management of limited aciclovir supplies during the shortage the virology MDT decided to re-introduce the AVS programme for all patients prescribed parenteral antivirals (for all durations) from June 2023.

Method

During the 2022 and 2023 intervention periods, adult patients prescribed ACV IV were identified using a report generated by the UHBFT electronic prescribing system (known as PICS) twice weekly on Tuesdays and Fridays at 9am. All patients on the generated list were remotely reviewed that day by the AVS team which comprised an infection pharmacist, consultant virologist and a junior trainee (registrar or HSST trainee clinical scientist).

The AVS ward round involved remote review of patients including the rationale for ACV IVprescribing, dosing and appropriateness and if this was supported by the necessary sampling and diagnostics. In each case the AVS team

recommendations were documented in the electronic medical notes. AVS interventions were grouped into themes and categorised as: stop, continue, intravenous to oral switch (IVOS), dose modification, or sampling and diagnosis.

Data were collected on the time commitment required from the team to implement AVS ward rounds, the advice offered and whether this was accepted at 24 and 48 hours post intervention. Additionally, consumption and expenditure data were collected for ACV IV administered from January 2022 to September 2023.

Stewardship recommendations

During the 2022 and 2023 intervention periods, 80 and 144 reviews were conducted of patients prescribed ACV IV respectively. The breakdown of patients into immunocompromised and general specialities is shown in Table I.

Depending on the patient complexity, ward rounds had a mean duration of 35 minutes with an inter-quartile range of 25 minutes. The advice given during the ward rounds is summarised in Table II.

A notes review was conducted 24 and 48 hours after the antiviral ward round to document if advice was accepted. Advice offered by the AVS team to the host clinicians was accepted within 24 hours in 100% (n=80) cases in 2022 and 92.4% (n=133) of cases in 2023. In the remaining 7.6% of cases, advice was accepted at 48 hours.

Consumption and expenditure

Consumption and expenditure data for ACV IV was collected from electronic pharmacy dispensing systems and administration data accessed via the electronic patient record.

Table I

Breakdown between immunosuppressed patients and general specialities

In-patient speciality	n (%)	
	June–July 2022	June–September 2023
Immunocompromised Patients ^a	27 (33.8)	45 (31.3)
General Specialities	53 (66.2)	99 (68.7)
Total	80	144

^a HIV positive, solid organ and bone marrow transplant recipients.

Table II

Advice offered by the antiviral stewardship team following patients reviews

Antiviral stewardship recommendation offered	n (%)	
	June–July 2022	June–September 2023
Stop	26 (32.5)	75 (52.1)
Continue IV treatment	26 (32.5)	40 (27.8)
Dose modification	20 (25.0)	35 (24.3)
Sampling and diagnosis	20 (25.0)	29 (20.1)
IV to oral switch	17 (21.3)	21 (14.6)
Total Number of Reviews ^a	80	144

^a Some reviews made more than one stewardship recommendation.

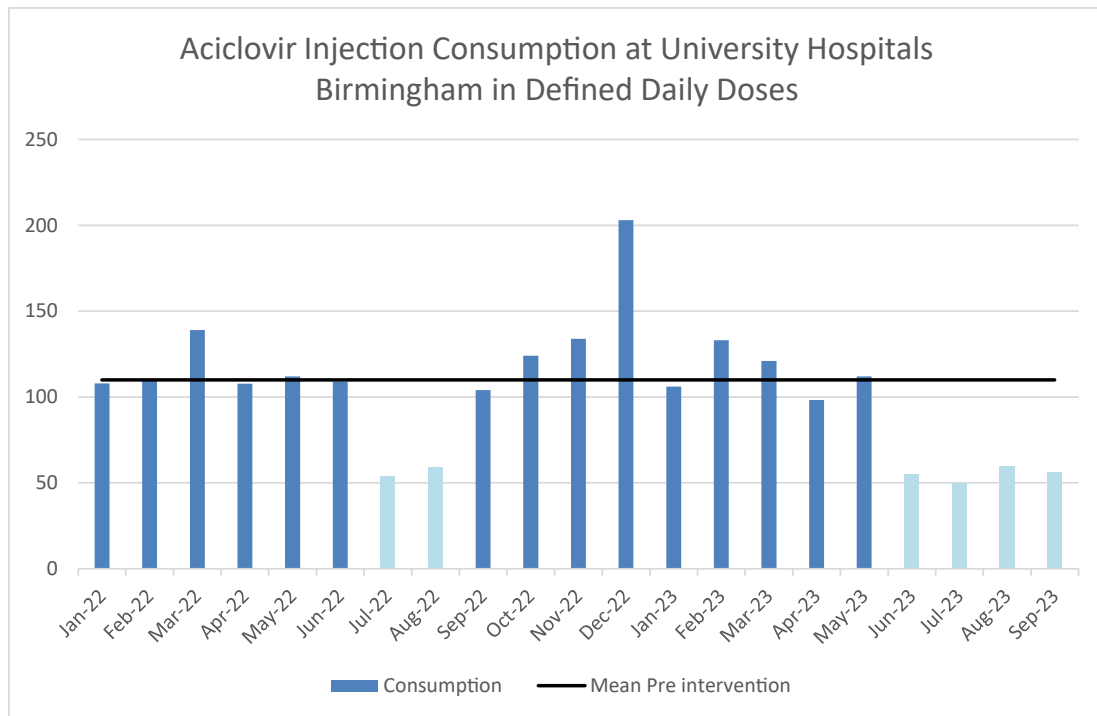


Figure 1. Aciclovir Injection Consumption at University Hospitals Birmingham in Defined Daily Doses.

Following implementation of the AVS between July and August 2022 monthly consumption of ACV IV reduced by 51.0%. On stopping the AVS programme, consumption returned to pre-intervention levels. Following re-introduction of AVS programme consumption once again reduced by 50.5% (Figure 1).

Mean ACV IV expenditure data was calculated for the months January 2022 to May 2023 excluding July and August 2022 when prices were inflated due to a manufacturers supply problem. Following introduction of AVS, monthly ACV IV expenditure was reduced by £2000 for the months June to September 2023.

Discussion

Following introduction of AVS programme between July and August 2022 consumption of ACV IV at UHBFT reduced by more than half. On stopping the programme in September 2022 consumption rapidly returned to pre-intervention levels. On re-introduction of AVS in June 2023 consumption of ACV IV once again reduced by 50.5%. This suggests that the intervention reduces ACV IV consumption and presence and advice of the specialist virology team is essential to drive this reduction.

This intervention required the virology team to meet twice weekly to discuss patients prescribed intravenous antivirals for a mean duration of 35 minutes. Of the 80 and 144 of documented patient encounters in 2022 and 2023, 32.5% and 52.1% were advised to stop ACV IV therapy in 2022 and 2023 respectively. This intervention however not only reduced the quantity of aciclovir consumed it also supported quality patient management with dose modifications recommended to adjust for body weight or renal function in 25.0% and 24.3% of reviews in 2022 and 2023 respectively. Diagnostic and sampling advice was offered in 25.0% and 20.1% of reviews in 2022 and 2023 which further supported prompt cessation on negative findings. It is proposed that by reducing treatment duration the AVS

intervention facilitated prompt discharge and reduced length of patient stay however the data for this intervention is still being analysed.

A limitation of this study is that paediatric wards were not on PICS during 2023 and 2023 and therefore children were not included in this study.

Conclusion

AVS ward rounds provide an opportunity to intervene to optimise sampling, diagnosis and improve management early in the patient journey to facilitate prompt cessation and early discharge. AVS is now well established at UHBFT and plans to be expanded to other hospitals nationwide.

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Conflict of interest statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics/informed consent

Not required for this study.

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