

Summary of National Antimicrobial PPS 2021 in Acute Hospitals

Introduction

Since 2009 the annual national antimicrobial point prevalence survey (PPS) has been completed in acute hospitals in Ireland with data submitted to the Health Protection Surveillance Centre (HPSC) for analysis. From 2009-2020 the PPS was coordinated by the Irish Antimicrobial Pharmacists Group (IAPG). From 2021 it will be coordinated by the HSE National Antimicrobial Resistance & Infection Control (AMRIC) team. The aim of a PPS is to gather information relating to antimicrobial prescribing for all inpatients in the hospital over a defined period (usually one day) to assess success of quality improvement work and inform the development of antimicrobial stewardship action plans. The time period for data collection for the 2021 PPS was 15.9.21 to 12.10.21.

Results

General

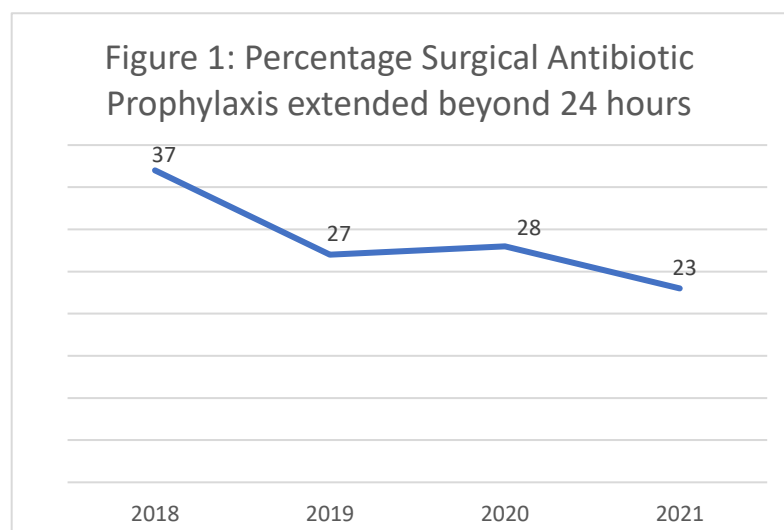
- The 2021 national antimicrobial PPS included 52 hospitals, the highest number of hospitals to date (2020: 48, 2019: 45, 2018: 44), and 10,388 patients were reviewed (2020: 8458, 2019: 8916, 2018: 8814).

Prevalence of antimicrobial prescribing

- The median prevalence of antimicrobial use was 39%, remaining largely unchanged over the last number of years (2020: 40%, 2019: 40%, 2018: 39%)
- Prevalence among specialties included: intensive care 52%, surgical 52%, medicine 36%, obstetrics/gynaecology 21%, other 21%.

Indication and diagnosis

- The majority of indications for antimicrobial use were community acquired infections. Fifty-two per cent of antimicrobials were prescribed for community infection (2020: 54%, 2019 & 2018: 55%), 25% for healthcare associated infection (2020: 24%, 2019: 25%, 2018: 23%), 10% for medical prophylaxis (2020: 8%, 2019 & 2018: 9%) and 9% for surgical antimicrobial prophylaxis (SAP) (2020: 10%, 2019 & 2018: 8%), thus remaining broadly similar to previous years.
- Twenty-three percent received surgical antibiotic prophylaxis extended beyond 24 hours (2020: 28%). The positive downward trend over the last 4 years is shown in the figure 1.
- Pneumonia, intra-abdominal and skin/soft tissue infections (SST) were the most common body sites with infection for which antimicrobials were prescribed: 26%, 14% and 12% respectively. (2020: 21%, 14%, 9%).



Antimicrobial agents prescribed

- Co-amoxiclav (19%) and piperacillin-tazobactam (17%) combined accounted for 36% of all prescriptions (2020: 38%, 2019: 37% 2018: 36%).
- The overall prevalence of metronidazole prescription showed a slight decrease (2021: 5.7%, 2020 6.4%) and there was a reduction in the prevalence of metronidazole use in combination with a second agent with anaerobic activity to 34% (2020 & 2019: 42%).
- Clarithromycin decreased in ranking from 9th (2020: 3.3%) to 11th (2021: 2.7%) as did gentamicin from 7th (2020: 3.7%) to 10th (2021: 3.1%).
- Cefuroxime increased in ranking from 4th to 3rd (2021: 6.2%, 2020: 5.5%).
- An increased prevalence of azithromycin prescription was observed (2021: 1.9%, 2020: 1.4%).
- Compared to 2020, there was very little variation noted in the usage of flucloxacillin, vancomycin, ciprofloxacin, doxycycline, ceftriaxone, meropenem, sulfamethoxazole/trimethoprim and amoxicillin.

Parenteral and oral route

- The majority of antimicrobials (67%) were administered via the IV route, consistent with observed results from previous years (2018, 2019, 2020: 68%).
- Table 1 shows the proportion of prescriptions for agents classified as agents of excellent oral bioavailability (i.e. >90%), that were administered by the parenteral route.

Table 1: Proportion of specific antibiotics with excellent oral bioavailability used in parenteral form

Agent	2021	2020
Clindamycin	66%	61%
Metronidazole	63%	68%
Linezolid	48%	44%
Ciprofloxacin	39%	28%
Levofloxacin	19%	21%

Appropriateness of Antimicrobials

- Broadly unchanged in 2021 were the percentage of overall compliant therapies (compliant for agent, duration, dose, route or micro/ID approval) at 78% (2020: 77%, 2019: 77%, 2018: 74%), considering agent of choice alone for compliance at 84% (2020: 85%, 2019: 84%, 2018: 82%) and indication documentation at 91% (2020: 91%, 2019: 92%, 2018: 89%).
- The proportion of prescriptions which had been discussed with an infection specialist increased to 42% (2020: 29%, 2019: 29%, 2018: 26%).
- Twenty-two per cent of prescriptions were noted as non-empiric (i.e. pathogen-directed) therapy (2020: 18%).
- Eighty-four per cent of antimicrobial prescriptions were considered to be of appropriate duration at the time of the PPS (2020: 89%).
- An increasing trend in the proportion of prescriptions with a documented stop or review date to 47% was observed (2020: 45%, 2019: 42%, 2018: 34%).
- Compliance of restricted agents and meropenem with local policy was 81% (2020: 86%, 2019: 80%, 2018: 82%) and 85% (2020: 83%, 2019: 82%, 2018: 87.8%) respectively.
- Ninety-two per cent of patients had an allergy status documented. (2020: 93%).

Discussion

Despite the COVID-19 pandemic, the 2021 national PPS had the highest number of participants to date and all participants are commended for contributing to this important national antimicrobial stewardship work. In 2021, the overall prevalence of antimicrobial use was not significantly different from previous years. Encouraging findings included a reduction in clarithromycin use, a reduction in duration of surgical antibiotic prophylaxis extended beyond 24 hours and a reduction in the co-prescription of metronidazole with another agent with anaerobic activity. It is noted that there would have been variation in acute hospital case load during the COVID-19 pandemic which may limit comparability of this data. The increase in the proportion of antimicrobials prescribed for pneumonia may reflect this.

In 2021, there was a decrease in the proportion of surgical antibiotic prophylaxis extended beyond 24 hours to 23%. This is in line with the previous decreasing trend observed in the period 2018 to 2020. It is recognised that changes in the category of patients receiving surgery due to the COVID-19 pandemic (less elective surgery, more complex patients and emergency procedures), as well as a change in the number and type of participating hospitals, may have affected this data.

Surgical antibiotic prophylaxis has been the subject of a national quality improvement project. A national surgical antibiotic prophylaxis duration position statement was published in Q3 2021. Compliance with this position statement, is now a key measure outlined in the HSE AMRIC action plan 2022-2025. With an increased focus on promoting and supporting implementation of this quality improvement at the hospital level, a continued reduction in duration of surgical antibiotic prophylaxis in line with the national consensus position statement will be a key priority going forward. Hospital level actions may include amendment of local protocols and documents, use of the audit tool to support local quality improvement, dissemination of the position statement through established governance structures and education.

There was a welcome reduction in the overall use of both co-amoxiclav and piperacillin-tazobactam, however combined penicillin and beta-lactamase inhibitor use remains high in Ireland. Due to the broad spectrum of these agents, they have a propensity to promote antimicrobial resistance.

There were positive trends in metronidazole use noted; a reduction in the overall prevalence of metronidazole use, a reduction in the use of metronidazole in combination with agents with anaerobic activity and a reduction in parenteral use compared to 2020. The production and dissemination of a metronidazole educational factsheet in November 2020 as well as local antimicrobial stewardship campaigns may have contributed to this finding.

In line with previous PPS, the majority of antimicrobial use was parenteral. There was an increase in the proportion of certain agents with excellent oral bioavailability (ciprofloxacin, linezolid, clindamycin) that were used parenterally compared to 2020. There may be increased capacity for intravenous to oral switches considering the number of agents prescribed parenterally which have excellent bioavailability and as growing evidence supports increased use of the oral route for infections that were traditionally only treated parenterally.

There was a positive trend observed in the increasing proportion of prescriptions with a documented stop or review date over the last number of years. Otherwise, there was little change in the appropriateness of antimicrobial prescribing and compliance with local policy observed compared to recent years. These findings may have been impacted by the shift in healthcare system focus and resourcing during the COVID-19 pandemic away from antimicrobial stewardship. An Irish survey in May 2020 of healthcare professionals involved in AMS programmes in the acute hospital setting found that 76% (65/86) reported that COVID-19 had impacted on the effective implementation of AMS programmes locally.

Key recommendations

Key antimicrobial stewardship areas for local improvement, if applicable, which the survey has highlighted include:

1. Further reduction in surgical antimicrobial prophylaxis extended beyond 24 hours duration.
2. Focus on promoting oral use of agents with excellent oral bioavailability.

To address recommendations outlined in this report, the HSE National AMRIC team will:

- Ensure widespread communication of PPS findings to highlight priority areas for quality improvement.
- Continue to collaborate with the National Clinical Programme for Surgery and the Royal College of Surgeons in Ireland and establish relationships with relevant speciality groups to maintain a focus on the position statement on surgical antibiotic prophylaxis duration.
- Start the process to create a national green/amber/red classification for antimicrobials in acute hospitals to support feedback and quality improvement.
- Promote oral use of antimicrobials with excellent oral bioavailability through development of a quick guide and supportive resources.
- Collaborate with key stakeholders to review the PPS protocol ahead of the 2022 PPS.

Acknowledgements

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