Antimicrobial Use in Republic of Ireland (ROI) : Analysis of Data from the National Antimicrobial Point Prevalence Surveys 2009 - 2013 Analysis of 5 Years Data

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Introduction

Point Prevalence Studies (PPS) obtain quality information on antimicrobial prescribing in hospitals at a particular point in time. The data gathered can be used to (i) determine prescribing trends (ii) identify areas of prescribing which may benefit from intervention (iii) compare results with those from previous years and with those from other hospitals/ countries and (ix) as an indicator of the efficacy of antimicrobial stewardship programmes/policies. For the last five years from 2009-2013 an annual national antimicrobial PPS has been carried out in Ireland. This is an analysis of the results over the five years.

Aims & Objectives

- To collate and analyse antimicrobial prescribing data from the 2009 – 2013 Irish National Antimicrobial PPS.
- Identification of prescribing trends or practices which may warrant intervention or reflect the impact of existing antimicrobial stewardship programmes.

Methodology

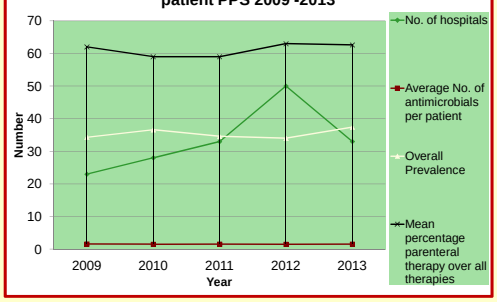
Each year the data collection was organized by hospital pharmacists according to a protocol. The 2009 PPS was conducted in June & July as part of the European Surveillance of Antimicrobial Consumption (ESAC) by the Irish Antimicrobial Pharmacist Group (IAPG) & Health Protection Surveillance Centre (HPSC) in Ireland. The 2010, 2011 & 2013 antimicrobial PPS was carried out in September/October by the IAPG & HPSC. The 2012 antimicrobial PPS carried out in May was combined with the national PPS of Hospital-Acquired Infections (HCAIs) & Antimicrobial Use (AMU). The initial data collection form used in 2009 was used in all future audits (except 2012). Data collected included : patient demographics, details of systemic antimicrobial therapy, diagnoses & indication, compliance with local guidelines, documentation of reason for therapy, allergy status & whether a course length had been prescribed. Data collected varied slightly from year to year. Data was analysed by the HPSC and feedback provided to each participating hospital.

Results

Antimicrobial Use (AMU) Prevalence

The median prevalence of AMU from 2009 – 2013 ranged from 34% to 37.4%. Fig. 1 below shows that there was a reduction in the prevalence of AMU in 2011 and 2012 but it rose again in 2013. The number of participating hospitals ranged from 23-50. In 2012 50 hospitals took part as the audit was incorporated into the national HCAI audit. The number of antimicrobials per patient varied very little in the 5 years ranging from 1.58 to 1.5 yet showed a decreasing trend. The mean prevalence of parenteral antimicrobials ranged from 59% - 63% with a reduction in 2010 & 2011 to 59% increasing back up to 63% in 2012 & 2013.

Fig. 1 No. of Particpating Hospitals, Prevalence of Antimicrobial Prescribing, Prevalence of IV Therapy and Average No. of antimicrobial per patient PPS 2009 -2013



Parenteral and Oral Therapy

Use of ciprofloxacin & metronidazole the two most commonly prescribed highly orally bioavailable antimicrobials in 2011 & 2013 was examined. In 2013 compared to 2011 prevalence of IV ciprofloxacin fell by 11% from 23.2% to 20.7% and IV metronidazole fell by 8% from 60.2% to 55.4%. Oral use of these agents also decreased in 2013 compared to 2011.

Results

Antimicrobial Agents Used

The ten most commonly prescribed antibiotics remained predominantly the same over the five years. Co-amoxiclav, piperacillin-tazobactam and metronidazole were the three most commonly prescribed antibiotics each year (see fig.2). The prevalence of different classes of antimicrobials was also examined (see fig. 3). There was a reduction in the prevalence of quinolones, gram-positive agents, cephalosporins and metronidazole. Prevalence of meropenem remained at 2-3% over the 5 years.

Fig. 2 Ten Most Frequently Prescribed Antimicrobials in National PPS 2009 V 2013

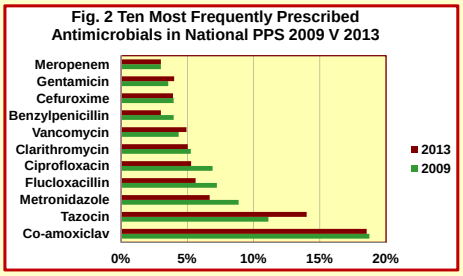
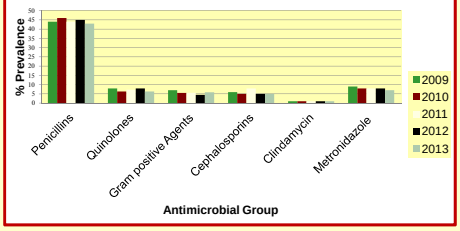


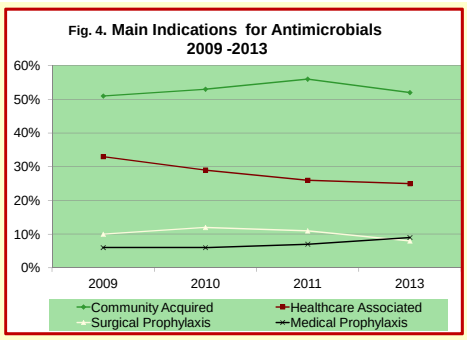
Fig. 3 Prevalence of Different Antimicrobial Classes National PPS 2009 - 2013



Indication & Diagnosis Sites

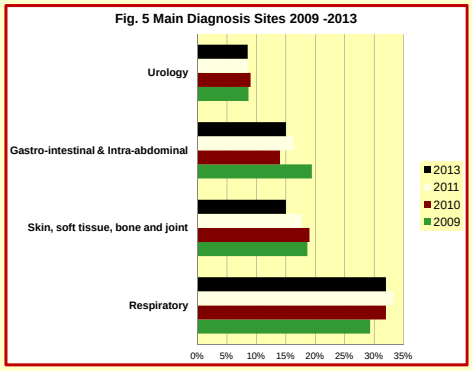
The main indications for antimicrobial therapy were classified into four main categories: community acquired, HCAI, medical prophylaxis and surgical antimicrobial prophylaxis (SAP). Fig. 4 below shows the breakdown of indications for four years . SAP and HCAI indications have fallen in recent years.

Fig. 4. Main Indications for Antimicrobials 2009 -2013



Respiratory tract infections accounted for the largest proportion of diagnosis sites for the last five years 29-33%, followed by gastro-intestinal & intra-abdominal infections 15-18% , then skin, soft tissue bone & joint 14-15% and then urology 9%. These four diagnosis sites accounted for 71-76% of all antimicrobials prescribed over the 5 years.

Fig. 5 Main Diagnosis Sites 2009 -2013

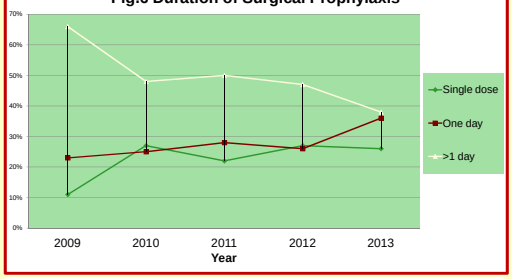


Results

Surgical Antimicrobial Prophylaxis

There was also a significant reduction in the duration of SAP (see fig.6) the percentage of prescriptions for SAP of one dose increased from 11% in 2009 to 26% in 2013. SAP greater than 1 day dropped from 66% in 2009 to 38% in 2013 .

Fig.6 Duration of Surgical Prophylaxis



Compliance with Antimicrobial Guidelines

Compliance with local antimicrobial guidelines fell slightly over the 5 years 77% of prescriptions compliant in 2009 Vs 73% compliant in 2013. Documentation of indication for antimicrobial therapy by prescribers increased over the 5 years from 75% to 83% and documentation of allergy status rose from 83% in 2011 to 91% in 2013. In 2013 clarification of allergy status was included in the audit for the first time. 201 patients were documented as allergic to penicillin upon clarification of allergy status it was discovered that 51% (101) of these patients could tolerate a beta-lactam antimicrobial. 22% of prescriptions had a course length documented in 2013 and 23% in 2011.

Discussion

Analysis of the results of the National Antimicrobial PPSs 2009 - 2013 highlight the following :

- Significant & consistent reduction in duration of SAP since 2009.
- Prevalence of penicillins over the 5 years has remained largely the same (44-46% prevalence).
- Reduction in prevalence of ciprofloxacin and metronidazole both orally and IV .
- Prevalence of reserve/second line antimicrobials – cephalosporins, gram-positive agents , clindamycin and meropenem have all remained low for the last 5 years despite increasing antimicrobial resistance rates.
- Documentation of indication for antimicrobial therapy has increased by 11% over the last 5 years and allergy documentation has also improved.

This is a reflection of antimicrobial stewardship initiatives that have been introduced into a number of hospitals nationally.

There has not been a significant change in the prevalence of antimicrobial prescribing over the 5 years however it has remained between 34-37.4%. In 2011 in the U.K the prevalence was 35%. There are many factors that may influence this the main issue being reduced resources in areas that have an impact on antimicrobial prescribing staffing in particular. Documentation of course lengths is a key area for improvement 79% of antimicrobial prescriptions had no course length prescribed in the 2013 audit. Improvement in this would have a positive impact on prevalence of antimicrobial use. Parenteral use of antimicrobials has also increased slightly from 59% to 63%. Factors that may have influenced this are patient mix & the introduction of home IV antimicrobial services. Patients may be discharged earlier on IV antimicrobials as a result there is less of a remit for switch to oral therapy as an inpatient. The clarification of allergy status carried out in 2013 highlights that nationally a high proportion of patients documented as allergic to penicillin are not actually truly allergic to penicillin.

Conclusion

Point prevalence studies are a useful method of monitoring prescribing patterns and identifying targets for antimicrobial stewardship initiatives. This analysis shows that antimicrobial stewardship initiatives introduced nationally have had a sustained impact on antimicrobial use and highlights documentation of course lengths & timely review of IV antimicrobials as key areas for improvement.

References & Acknowledgements

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