

Hand Infections in a Tertiary Setting: A Retrospective Review of Microbiological Investigation and Management

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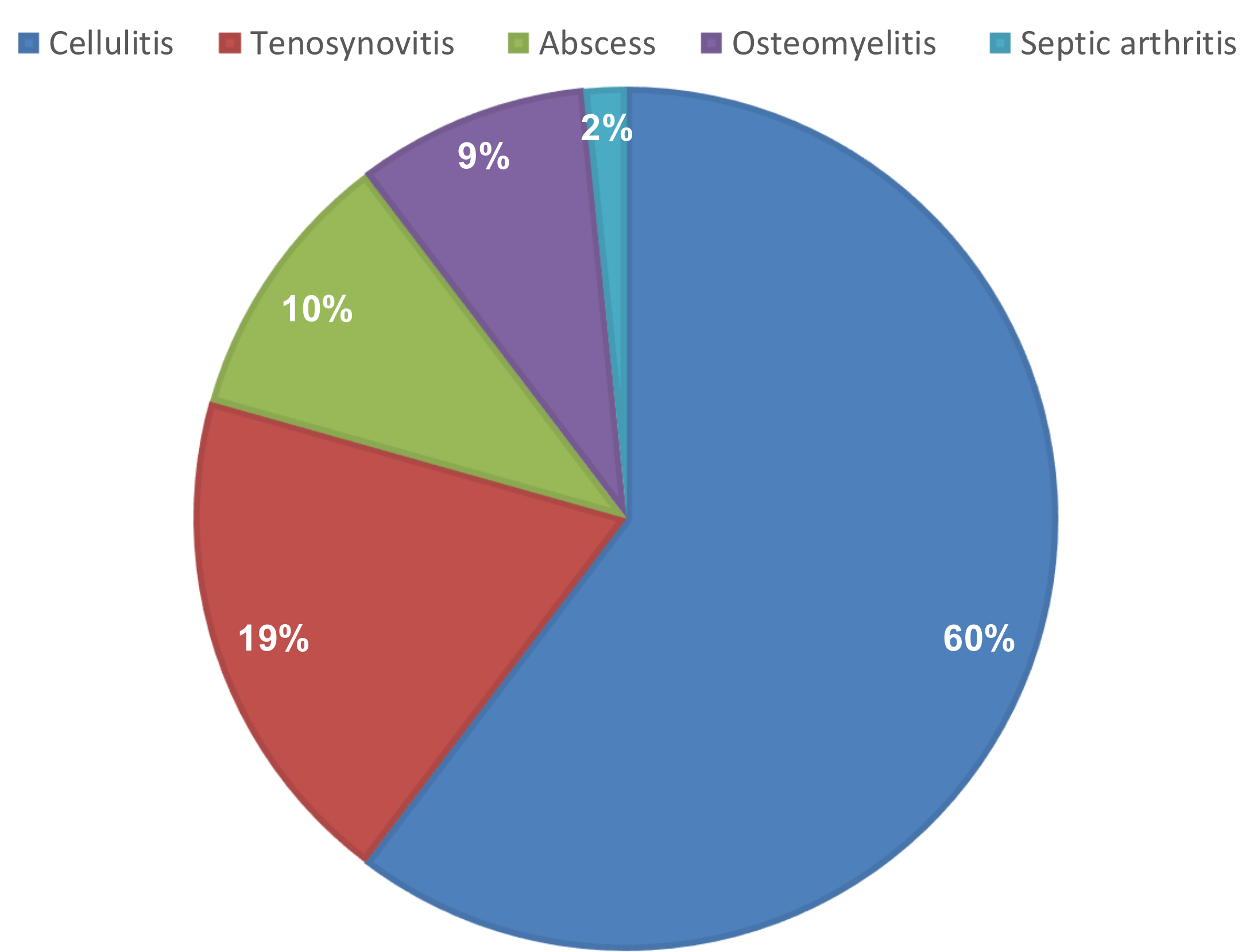
INTRODUCTION

- Infections of the hand, including septic arthritis, osteomyelitis, and skin and soft tissue infections, are a common presentation in tertiary care centres.
- Optimal management requires early diagnosis, appropriate antimicrobial therapy and surgical intervention if indicated¹.
- Microbiological sampling and targeted antibiotic therapy are key components of effective treatment and antimicrobial stewardship.
- This audit aimed to evaluate current practice in the management of hand infections, focused on microbiological investigation, antimicrobial use and adherence to best guidance principles.
- This was a retrospective observational study using data collection from the electronic record system at St James' Hospital.

DEMOGRAPHICS

- 126 patients were included, 85 male (67%) and 41 female (33%).
- Age ranged from 16 to 84 years old, with a median age of 45 years old.
- Diagnoses included cellulitis (n=76), tenosynovitis (n=24), abscess (n=13), osteomyelitis (n=11) and septic arthritis (n=2).
- Risk factors for invasive infection were prevalent, including smoking (44%), diabetes (6%) and immunosuppression (5%).
- Median time to presentation from date of injury was 4 days.
- Length of inpatient stay ranged from 1 to 27 days, with a median of 4 days.

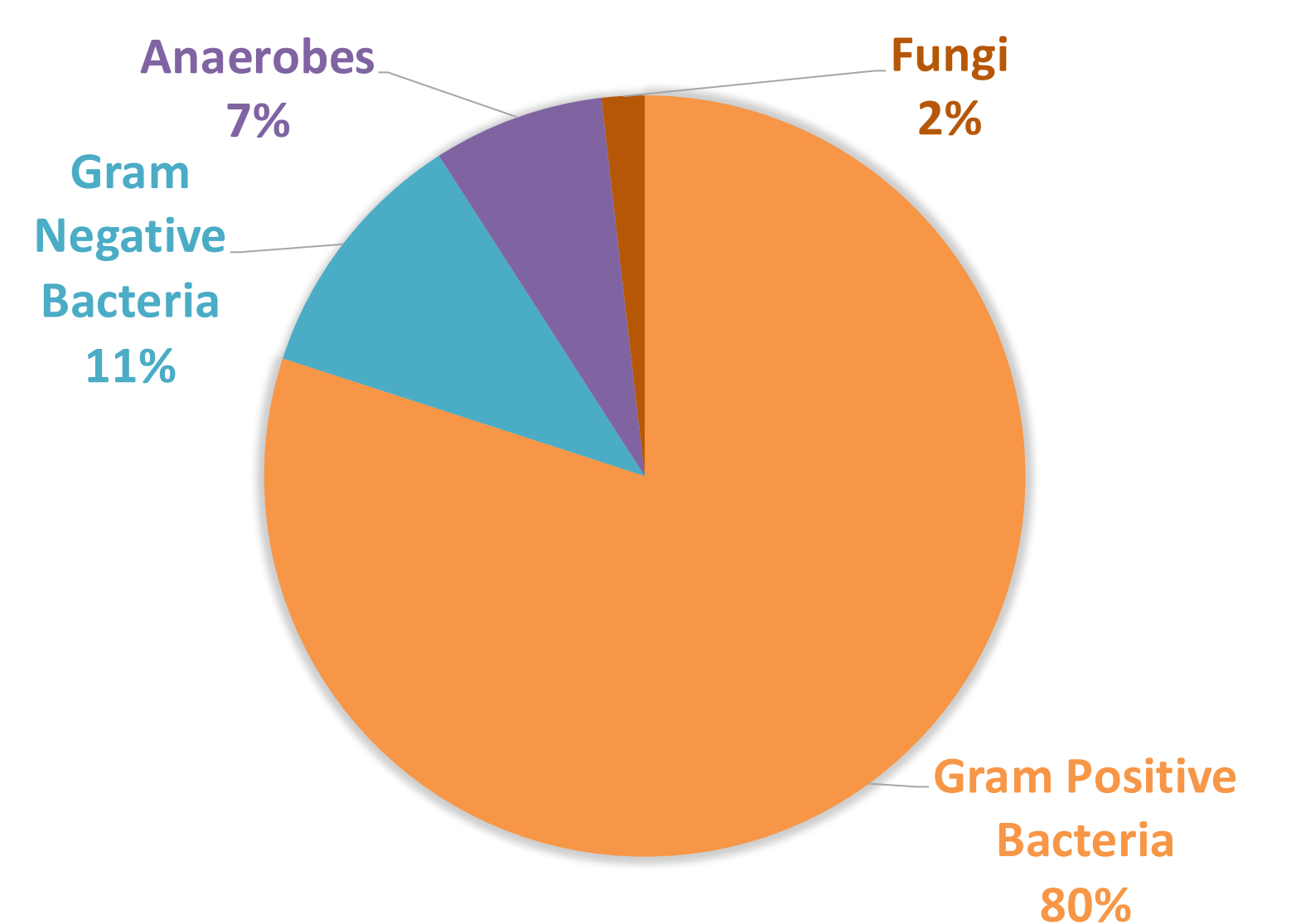
DIAGNOSIS



MICROBIOLOGICAL RESULTS

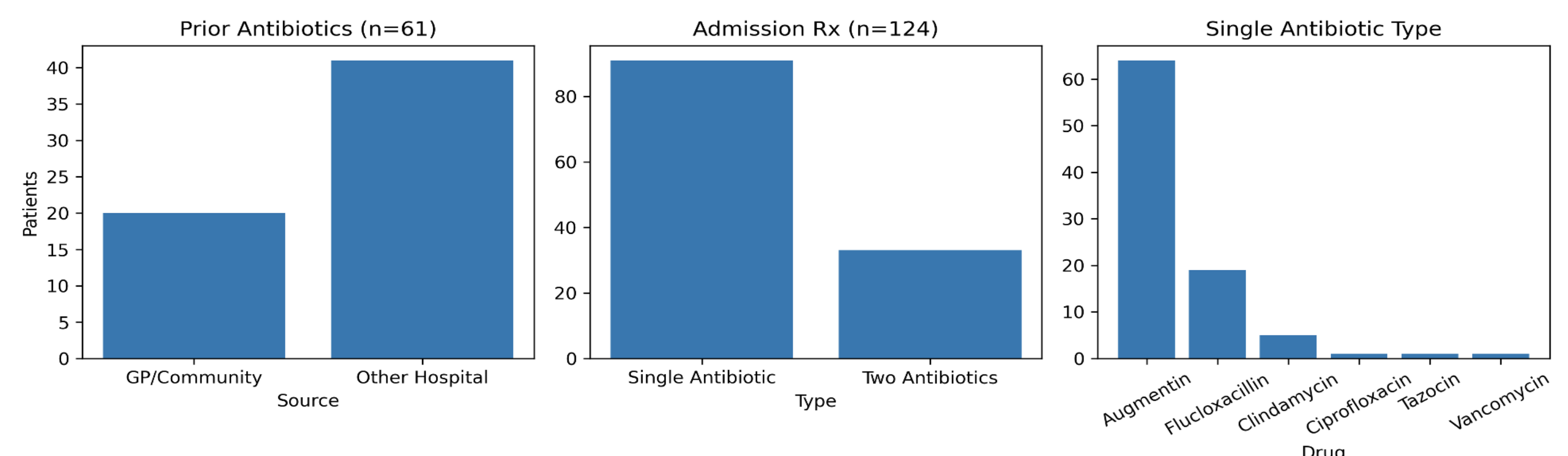
- 70 cases yielded positive cultures, with the most common organisms being *Staphylococcus Aureus* (59%), *Staphylococcus epidermidis* (17%) and *Streptococcus pyogenes* (14%).
- Gram negative bacteria occurred in 12 cases, most commonly *Pasteurella* (n=6, 4.8%).
- Rare isolates included fungal organisms (2%) and *Methicillin-resistant Staphylococcus Aureus* (1%).

MICROBIOLOGICAL GROWTH



MANAGEMENT

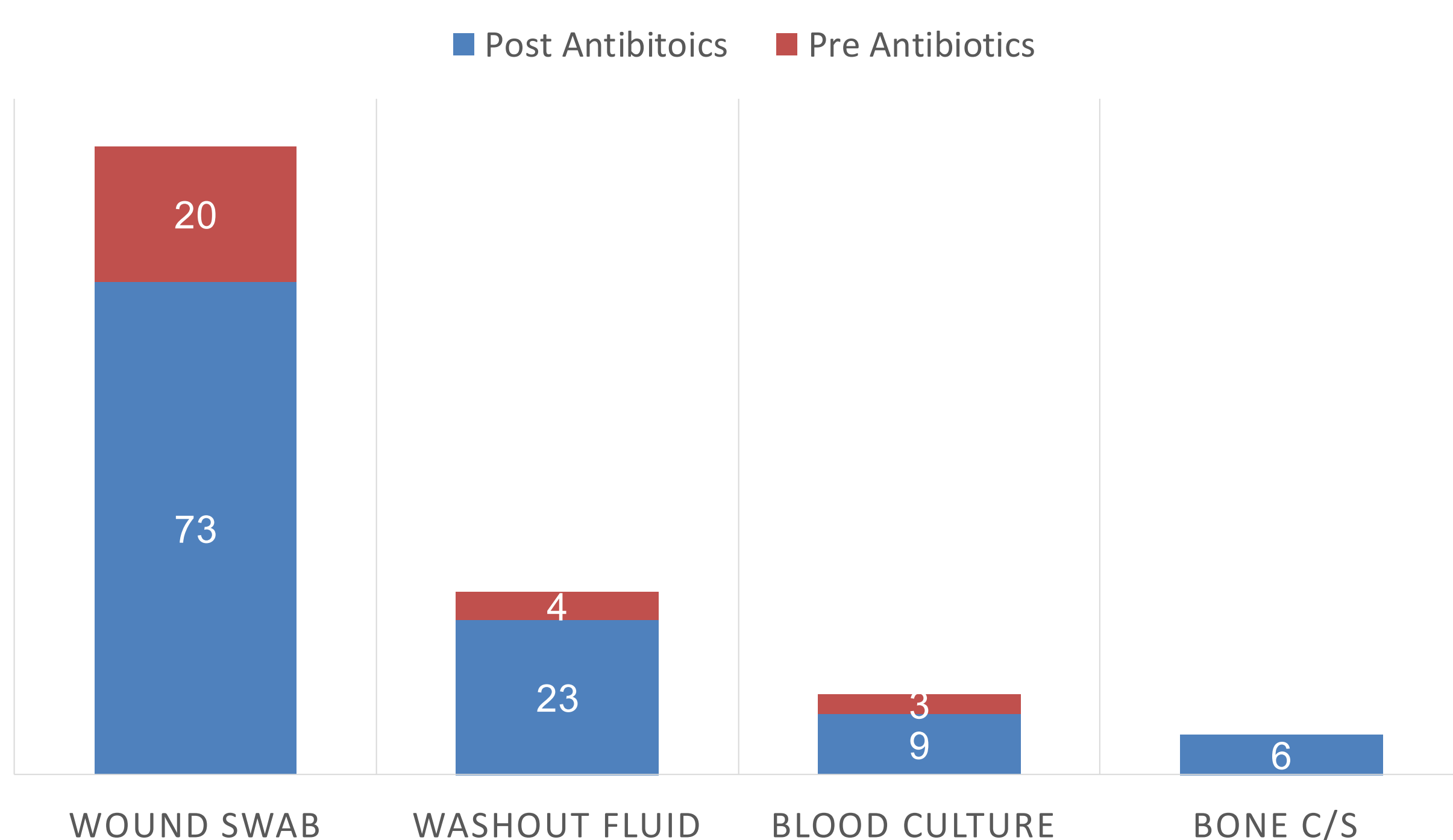
- The Infectious Disease team was consulted in 16 cases (13%), including all cases of osteomyelitis (n=11) and septic arthritis (n=2), as well as 2 cases of cellulitis and 1 case of abscess formation. All cases of osteomyelitis and septic arthritis were managed primarily under the Plastics surgical team, with the Infectious Disease team consulting.
- Sensitivity data were available for 58 cases, with antibiotics changed based on culture results in 35 cases (60%).
- Prior to presentation, 61 people (48%) had received antibiotics, most commonly flucloxacillin (n=16, 26%) or co-amoxiclav (n=13, 21%).
- On admission, 124 people (98%) were prescribed antibiotics, most commonly co-amoxiclav (n=64, 52%) or flucloxacillin (n=19, 15%).
- Total duration of antibiotics ranged from 0 to 77 days, with a median of 9 days.
- 6 people required Outpatient Parenteral Antimicrobial Therapy.
- The tetanus vaccine was administered in 40 people (31.7%).
- Tetanus status was undocumented in 67% of cases.
- 98 patients (78%) underwent at least one surgical intervention. Of these, 82 (65%) had a single procedure, 14 (11%) underwent two procedures, and 2 (1.6%) required three procedures. The remaining 28 patients (22%) were managed non-operatively.
- Recurrence of infection was relatively uncommon (n=9, 7%) but associated with underlying risk factors (n=8), lack of antibiotic rationalisation (n=3) or incomplete treatment due to self-discharge (n=3).



MICROBIOLOGICAL INVESTIGATIONS

- Blood cultures were taken in 12 cases (9.5%), with only 25% obtained prior to antibiotic administration.
- The most common sample types were wound swabs (n=93, 74%) and joint washout fluid (n=27, 21%).
- Excluding blood cultures, 100 people (79%) had microbiological samples sent.
- 4 people were febrile during their admission (3%), of which only 2 had blood cultures sent.

MICROBIOLOGICAL INVESTIGATIONS



DISCUSSION

- This audit demonstrates that the overall management of hand infections in St James' Hospital is proactive, with high rates of antibiotic use and surgical intervention. This aligns with established guidelines emphasising early intervention to prevent progression and functional impairment^{1,2}.
- Limitations of this audit include a retrospective design and a relatively small sample size. We also relied on accurate documentation on the electronic patient record.
- Several important gaps were identified when compared with best practice recommendations. Blood cultures were infrequently sent and usually taken after antibiotic initiation. This reduces diagnostic yield and limits targeted therapy. Guidelines suggest that blood cultures should be considered in patients with systemic features or severe infection, and that obtaining cultures prior to antibiotics improves diagnostic yield and enables targeted therapy¹.
- Microbiological sampling overall was relatively high (79%), which is consistent with good practice. The predominance of Gram-positive organisms, particularly *Staphylococcus aureus*, is well described in the literature on skin and soft tissue infections¹, supporting the appropriateness of initial empirical coverage.
- In a systemically well patient with localised infection, it is reasonable to aim to take microbiological samples prior to giving antibiotics, provided that does not lead to a significant delay in antibiotic administration¹.
- Only 60% of cases with sensitivities had antibiotic rationalisation. This represents a key antimicrobial stewardship gap, as de-escalation based on culture results is strongly recommended to reduce resistance, toxicity and unnecessary broad-spectrum exposure³.
- Empirical prescribing was heavily weighted towards co-amoxiclav. While this may be appropriate in certain polymicrobial or bite-related infections, guidelines generally recommend narrower-spectrum agents when possible, particularly for uncomplicated infections². In particular, local hospital guidelines in St James' recommend flucloxacillin, clindamycin or cefazolin as empiric therapy for most skin and soft tissue infections, rather than co-amoxiclav. The preference for co-amoxiclav reflects current broad-spectrum practice, despite guidelines favouring narrower spectrum agents for uncomplicated infections.
- Documentation, particularly of tetanus status, was inconsistent across the cohort.
- Ultimately, improving adherence to best practice in the management of hand infections is essential to reducing morbidity and preventing infection recurrence.

REFERENCES

- Dennis L, Stevens, Bisno AL, Chambers HF, Dellinger EP, Goldstein EJC, Gorbach SL, et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. *Clin Infect Dis.* 2014;59(2):e10-52.
- National Institute for Health and Care Excellence. Cellulitis and erysipelas: antimicrobial prescribing. London: NICE; 2019. (NICE guideline [NG141]).