

Prevalence, Antimicrobial Resistance, and Virulence Profiling of Hypermucoviscous *Klebsiella pneumoniae* in a Cardiac Tertiary Care Hospital in Kathmandu, Nepal

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BACKGROUND

Hypermucoviscous *Klebsiella pneumoniae* (hmvKp) is an emerging pathotype associated with severe infections and enhanced virulence, posing growing threat due to multidrug resistance.

However, data from South Asia remain limited, especially in cardiac patients.

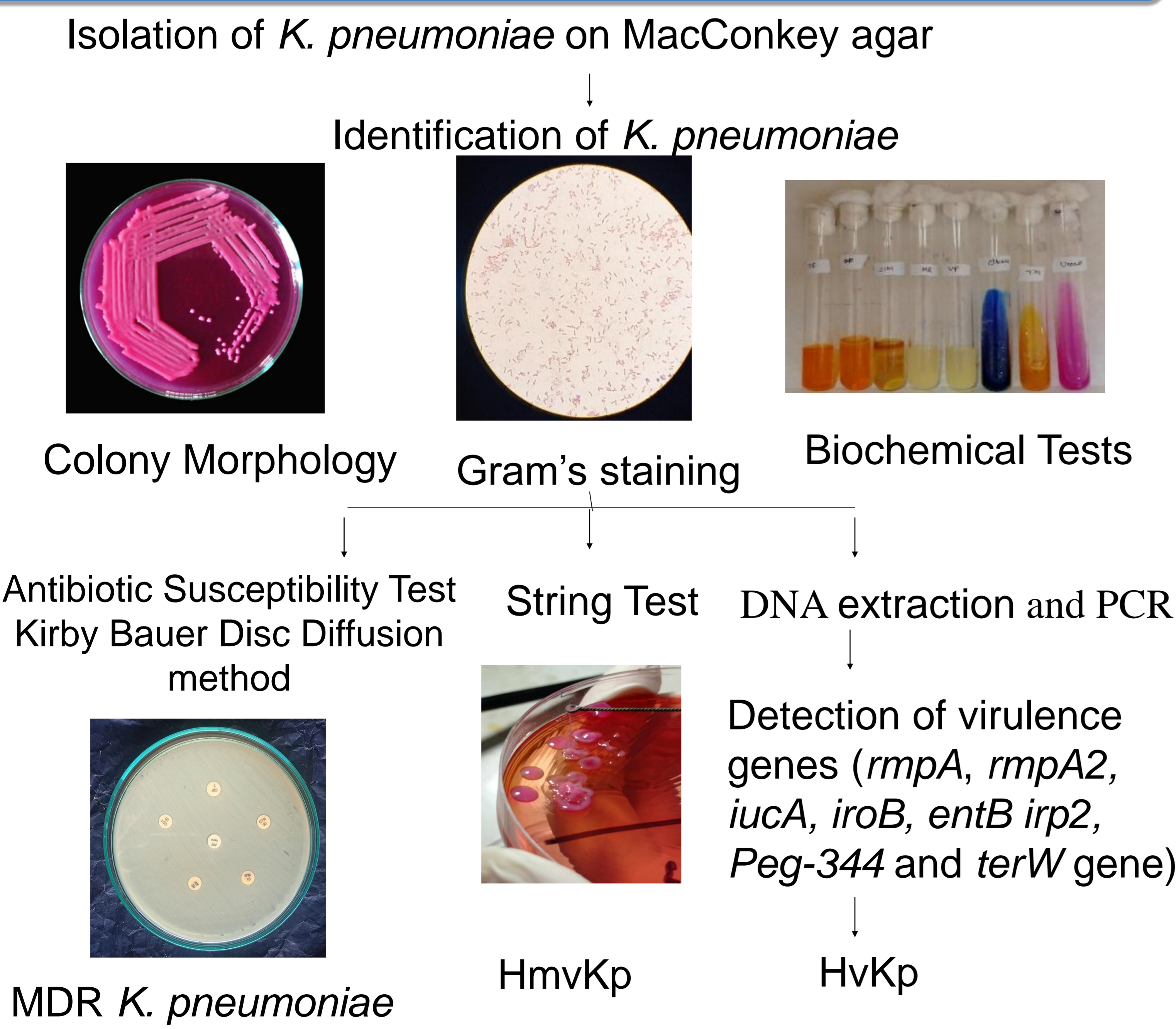
OBJECTIVES

To determine the prevalence, antimicrobial resistance patterns, and virulence gene distribution of hmvKp isolated from clinical specimens at a cardiac tertiary care hospital in Kathmandu, Nepal.

METHODS

- Study design:** Hospital based cross sectional study from September 2023 to February 2025
- Study population:** Clinical specimens from patients submitted for culture at Shahid Gangalal National Heart Centre, Nepal
- Sample size:** 1576 clinical specimens
- Ethical approval** from Institutional Review Committee (IRC) of Institute of Science and Technology (Ref. No.: 165/080/081) and Shahid Gangalal National Heart Centre, Bansbari (Ref. No.: SGNHC/IRC No.: 9-2024)

CLINICAL SPECIMEN PROCESSING



RESULTS

Total clinical samples processed - 1576
Culture positive samples - 351 (22.27%)

K. pneumoniae isolates - 79 (22.51%)
Hmv *K. pneumoniae* isolates- 16 (4.56%)

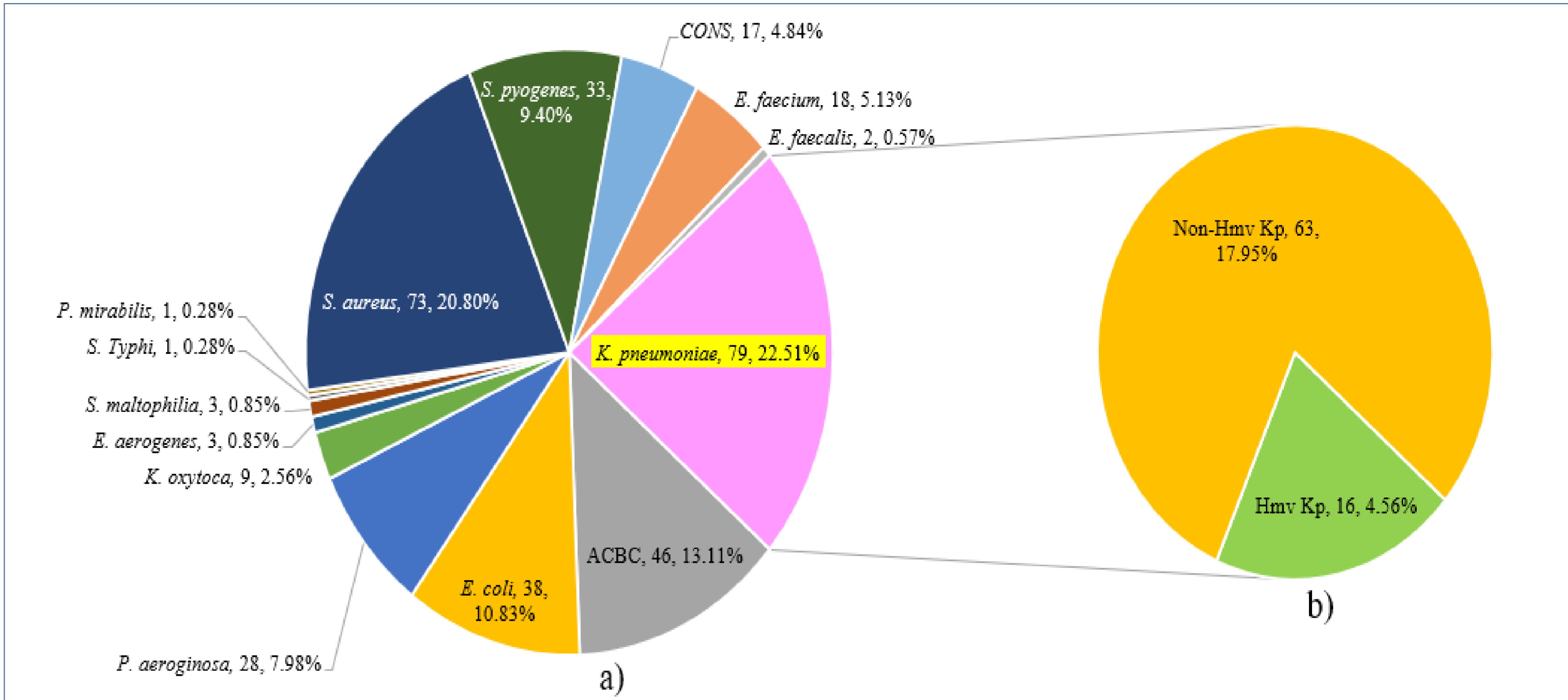


Figure 1: a) Bacterial profile from clinical isolates; b) prevalence of Hmv Kp among *K. pneumoniae* isolates

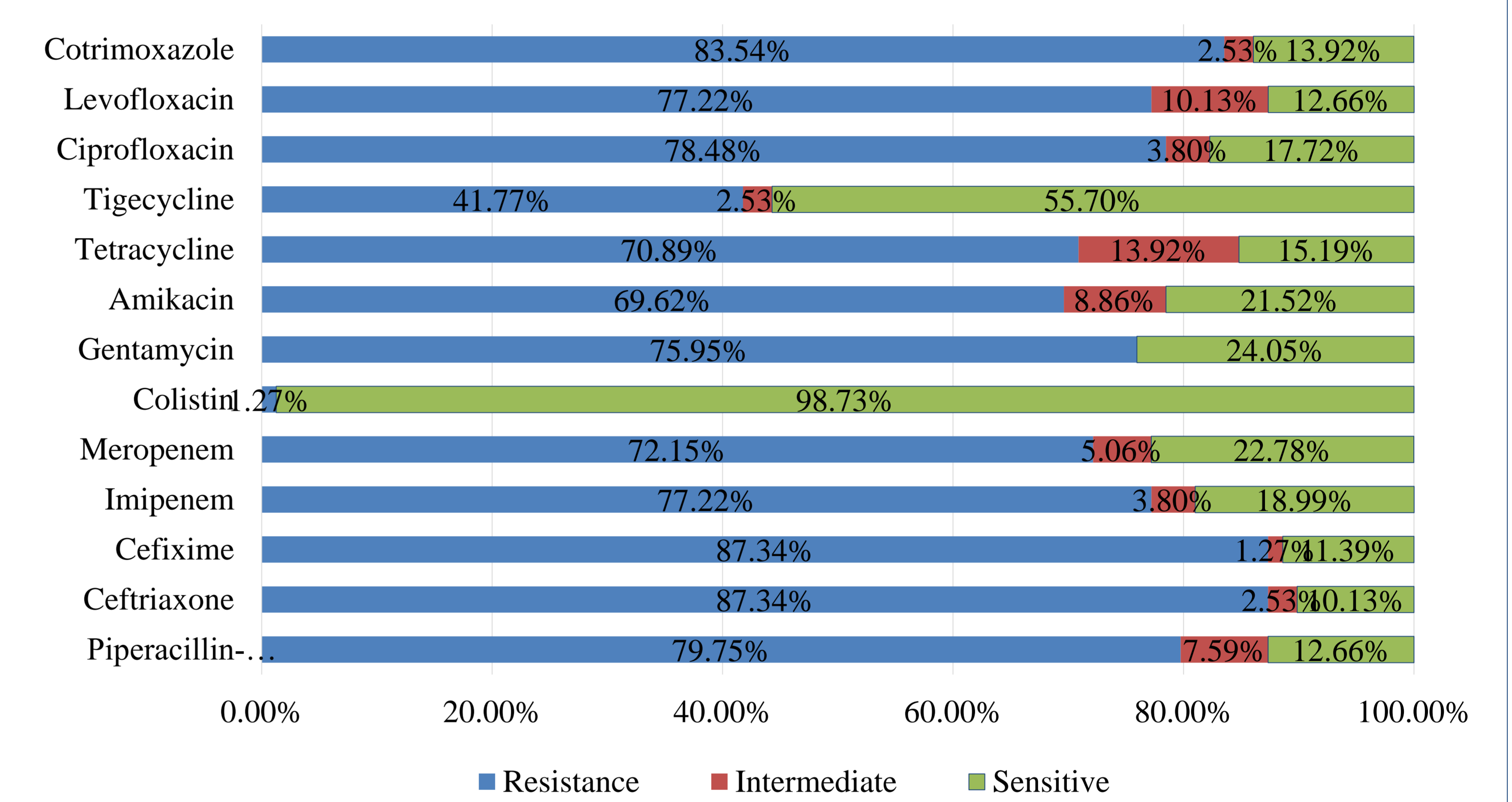


Fig 2. Antibiotic susceptibility pattern of *K. pneumoniae*

Prevalence of MDR *K. pneumoniae* isolates among Hmv Kp and non- Hmv Kp

| Category | Total N=79 | | Hmv Kp N=16 | | Non- Hmv Kp N=63 | |
|----------|------------|--------|-------------|-------|------------------|--------|
| | No. | % | No. | % | No. | % |
| MDR | 64 | 81.01% | 14 | 87.5% | 50 | 79.37% |
| Non- MDR | 15 | 18.99% | 2 | 12.5% | 13 | 20.63% |

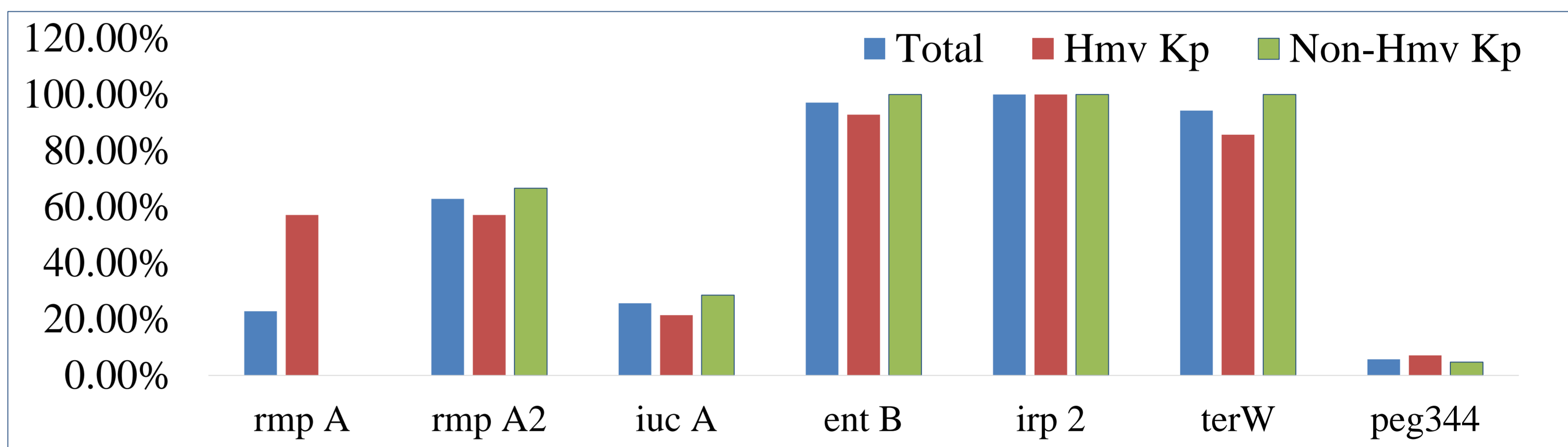


Fig 3. Prevalence of virulence genes among MDR *K. pneumoniae*

ACKNOWLEDGEMENTS

- Patients for providing specimens
- OWSD Early Career Fellowship for partial support (Laboratory analysis)

CONCLUSION

- Hypermucoviscous *K. pneumoniae* is present in cardiac care settings in Kathmandu, Nepal, exhibiting high multidrug resistance and notable virulence gene profiles.
- The strong association of *rmpA* with hmvKp strains highlights the need for robust molecular surveillance and targeted antimicrobial stewardship to prevent public health threats.