Clostridioides difficile in Irish Pigs – a Preliminary Study

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Introduction

Clostridioides difficile is a toxin-producing, Gram-positive, spore-forming, anaerobic enteropathogen of humans and animals. It is recognised as a cause of porcine neonatal diarrhoea. [1-3].

Porcine *C. difficile* -associated disease (CDAD) typically manifests itself as early-onset diarrhoea in piglets 1-7 days of age.

C. difficile is also one of the most important nosocomial pathogens of humans. In recent years the epidemiology of human disease is changing with more community-acquired infections and emergence of strains in humans that are common in domestic animals [4].

Therefore, considerable interest is developing in the potential zoonotic capabilities of *C. difficile.*

Objectives

- To investigate the prevalence of *C. difficile* in colonic contents of pigs referred for diagnostic necropsy to the Central Veterinary Research Laboratory, Backweston
- To compare strains identified with those identified in human *C. difficile* associated disease in Ireland.

Materials and Methods

Samples (n=188)

- Neonatal piglets (n=81)
  - With diarrhoea (n=75);
  - without diarrhoea (n=6)
- Other pigs (n=107)
  - With diarrhoea (n=30);
  - without diarrhoea: n=77

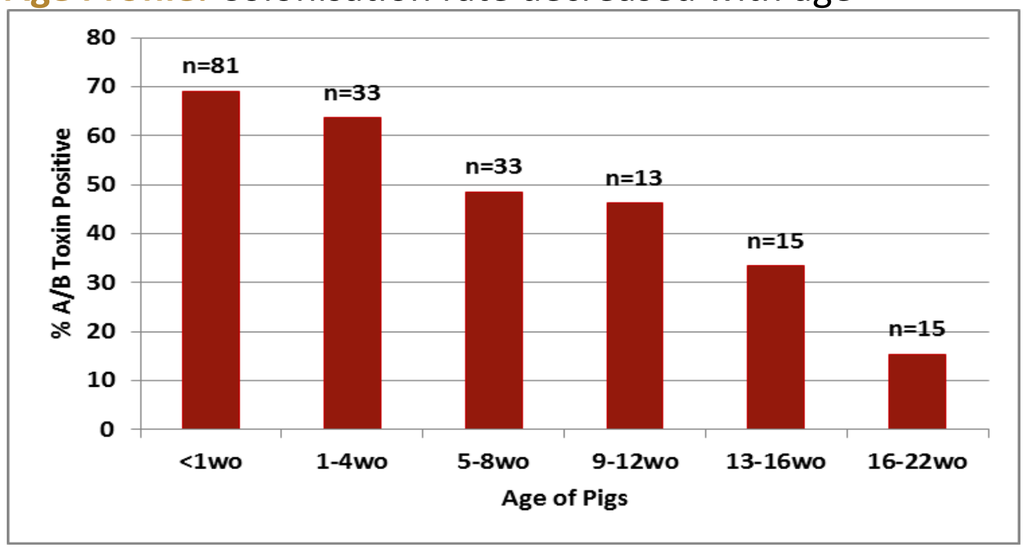
Methods

- Histopathology (n=58 neonatal piglets)
- ELISA A/B Toxins: Premier Elisa Kit Toxins A&B , Meridian Bioscience Inc.
- Isolation and PCR Ribotyping (n=65): as previously described [3]
- Statistics: Fischer exact test

Results

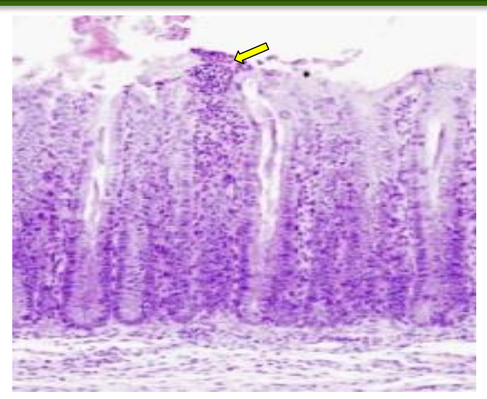
- Pigs came from 30 farrow-to-finish farms
- Median tested per farm: 4
- Farms were in 15 counties, widely geographically distributed
- 106 (56%) of samples were positive
- Positive samples were detected on all 30 farms (9% of commercial herds in Ireland)

- **Age Profile:** Colonisation rate decreased with age



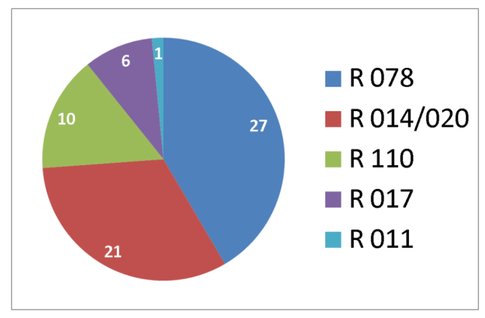
- **Association with diarrhoea:** Detection of *C. difficile* toxins was not associated with diarrhoea (p=0.367)

- **Histopathology:** Twelve of the piglets had an acute, ulcerative fibrinosuppurative typhlocolitis - typical of CDAD
- Colitis in neonatal piglets was not associated with detection of toxins A/B (p=1.0) - This may have been due to the high rate of colonisation

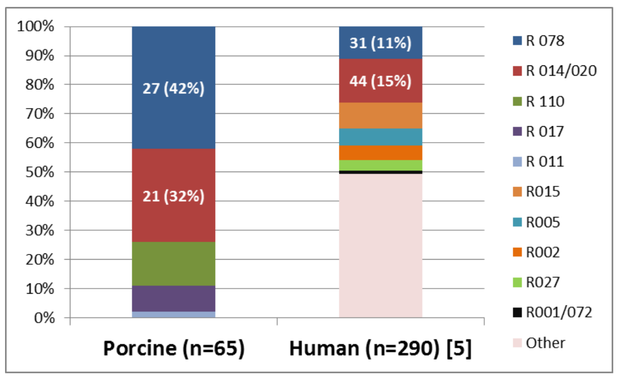


Superficial erosive and necrotising colitis with neutrophils and fibrin spilling into lumen ('volcano lesion' – arrow)

- **PCR ribotypes:** The most prevalent PCR ribotypes were R 078 and R 014/020



- **Comparison with human strains:** The most prevalent PCR ribotypes from porcine isolates are similar to those from human isolates [5]



Conclusions

- Colonisation of Irish pigs with *C. difficile* is common
- Therefore clinical significance of a positive *C. difficile* toxin result in a faecal sample cannot be interpreted in isolation from histopathology
- R 078 and R 014/020 were the most common ribotypes
- The diversity of ribotypes identified reflects:
  - those seen in pigs in other countries
  - those seen in human CDAD in Ireland
- A better understanding of the epidemiology of this pathogen in farm animals is required to elucidate risk factors for colonisation, any public health risks and potential interventions to mitigate these.

References

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