

Genotyping and virulence targets of *Campylobacter* from human and animals

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Key words

multilocus sequence typing (MLST), fla-typing, antibiotic resistance, epidemiology, human, pig, poultry, dog

Aim of the study

Investigate the epidemiology of *Campylobacter jejuni* and *C. coli* in Switzerland to elucidate major transmission routes and assess possible virulence traits.

Material and methods

Genotyping including MLST, fla-typing and antibiotic resistance towards quinolones and macrolides based on point-mutations. Human intestinal cell-culture cytotoxicity assays.

Results and significance

The epidemiology of *Campylobacter* in Switzerland resembles the one known from other countries where genotyping data are available with up to 80% of human cases being attributed to the chicken reservoir. Pigs do not play any significant role. Dogs show a very low *Campylobacter* prevalence but there is an association between human and dog but also chicken and dog isolates. Some Swiss peculiarities were observed, e.g. ST-45 which is prominent worldwide in human cases as well as in chicken, including Swiss broiler, is rarely found in humans in Switzerland. Antibiotic resistance is mainly observed towards quinolones and has increased in dog and chicken but remained constant in human and pig isolates. We could show association of antibiotic resistance with specific genotypes. Differences in cytotoxicity were observed with strains and even between identical genotypes from different sources. More details are given in the listed publications.

The outcome of the project strongly suggests focusing intervention strategies for reducing the public health burden of human campylobacteriosis on the chicken reservoir. The large strain collection of well characterized isolates and preliminary results on difference in virulence traits between strains will be the ideal basis for future research on elucidating virulence mechanisms and host-pathogen interaction of *Campylobacter*.

Publications, posters and presentations (without dissertations and *Campylobacter*-Plattform pres.)

- Kuhnert P., Egger R., Korczak B.M. Genotypes and antibiotic resistance of *Campylobacter coli* in Swiss fattening pigs. 16th International workshop on *Campylobacter*, *Helicobacter* and related Organisms (CHRO2011), Vancouver, Canada
- Egger, R., Korczak, B.M., Niederer, L., Overesch, G., Kuhnert P. Genotypes and antibiotic resistance of *Campylobacter coli* in fattening pigs. *Vet Microbiol.* 155:272-278 (2012)
- Niederer, L., Kuhnert, P., Egger, R., Büttner, S., Hächler, H., Korczak, B.M. Genotypes and antibiotic resistance of *Campylobacter jejuni* and *Campylobacter coli* from travel associated and domestic human cases. *Appl.Environ.Microbiol.* 78:288-291 (2012)
- Kittl, S., Korczak, B.M., Niederer, L., Baumgartner, A., Buettner, S., Overesch, G., Kuhnert, P. Comparison of genotypes and antibiotic resistances of *Campylobacter jejuni* and *Campylobacter coli* on chicken retail meat and at slaughter. *Appl.Environ.Microbiol.* 79:3875-3878 (2013)
- Kittl, S. *Campylobacter* genotyping: tracing the source of human infection. LMS TiHo-Hannover 12.3.2013
- Kuhnert, P. et al. Clonally related *Campylobacter coli* isolates of human and poultry origin differ in cytotoxicity and posttranslational processing of the major outer membrane protein PorA. 17th International workshop on *Campylobacter*, *Helicobacter* and related Organisms (CHRO2013), Aberdeen, Scotland, UK

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