

Campylobacter jejuni

(2005/2/20 2004/9/18)

Campylobacter jejuni

(9)

152

(*C.jejuni*)

DNA

Charcaol Yeast Extract (CYE)

. % 22.22

% 77.78

Neomycin Rifamicin Tetracycline

Ampicillin Co-Trimoxazole

Biotyping Some *Campylobacter jejuni* Isolates and Their Sensitivity to Common Antibiotics

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ABSTRACT

The study involved the biotyping of 9 isolates of *Campylobacter jejuni* (*C.jejuni*) isolated from 152 fecal samples from children with sever diarrhea. These isolates were identified depending on morphological and cultural characteristics and biochemical tests.

The study also aimed at checking the sensitivity and resistance of this bacterium to some common antibiotics. Biotyping was done depending on three biochemical tests,

Hydrolysis of hippurate, Hydrolysis of DNA and ability of growth on Charcoal Yeast Extract (CYE). This biotyping system includes eight biotypes. The results showed that all isolates belonged to two biotypes, the third and seventh. The third was the dominant comprising 77.78 % while the seventh contained only 22.22 % of the isolates. The study also showed that All isolates were sensitive to Neomycin, Tetracycline, Rifampicin but fully resistant to Co-Trimoxazole and Ampicillin. However, the isolates have variable sensitivity or resistance to Chloramphenicol, Gentamycin, Erythromycin and Ciprofloxacin.

		Typing	
	Campylobacter	phenotyping	
	Phage-typing	Serotyping	Biotyping
		:	<i>C.jejuni</i>
	Plasmid profiling		
	Ribotyping		
	Polymerase Chain Reaction (PCR)	PCR	
			(Newell et al., 2001; Bolton et al., 1992)
	<i>C.jejuni</i>	1982	Hebert
		:	
	Hippurate hydrolysis		-
	DNA hydrolysis		DNA -
	Growth on Charcoal Yeast Extract agar	CYE	-
		mortality	
			(Talaro and Talaro, 1996)

β-lactamase

β-lactam -

C.jejuni (Mims et al., 1995)

1998 Gilbert Gaudreau

1992 1986 1985

C.jejuni 1993

.Erythromycin

152

(9)

% 4.36 (2004 .) *C.jejuni*

1982 Hebert

Biotyping CYE DNA .system

Hwang and Ederer, 1975; Harvey,)

% 1 Brain-heart infusion broth - (1980

48

/ 3000 (Kallenkamp) 37

³ 0.4 kahn tube ³ 0.8 10

10

10

Deoxyribonuclease Test

DNase Test Agar (DTA) 1982 Hebert

DNase DNA

%0.005 DTA Methyl Green (MG)

° 37

1

DNA

Charcoal-Yeast extract (CYE)

C.jejuni

heart infusion broth

3

CYE

(Hebert et al., 1982)

(Baure et al., 1966)

Kirby-Bauer Technique

Hinton-Muller agar

-

(Vandepitte, 1991)

Erythromycin Gentamycin : Oxoid

Rifampicin

Tetracyclin Chloramphenicol

Co-trimoxazole Ciprofloxacin

Neomycin Ampicillin

C.jejuni

human gastroenteritis

(Bokkenheuser et al., 1979)

Bacteriophage

(Skirrow and Benjamin, 1980)

H₂S

H₂S

DNase

(Lior et al., 1982)

1982

Hebert

C.jejuni

C.jejuni

(1)

% 77.78

C.jejuni

C.jejuni % 22.22

Herbert

72

1982

22 94

C.jejuni :1

Test result for following biotypes								Test system
8	7	6	5	4	3	2	1	
-	-	-	-	+	+	+	+	Hippurate hydrolysis
-	-	+	+	-	-	+	+	DNA DNA hydrolysis
-	+	-	+	-	+	-	+	CYE agar Growth on CYE agar

C.jejuni (2)

C.jejuni

Neomycin Tetracyclin Rifampicin % 100

Ampicillin

% 100 Co-trimotazole

Gentamycin

% 44.4 Chloramphenicol % 33.3

.% 11.1

Ciprofloxacin % 22.2 Erythromycin

Gentamycin *C.jejuni*

Seanz

Gentamycin 2000

.(Pigran et al., 1997; Velazquez et al., 1995) *Campylobacter*

Rifampicin Tetracycline

44.4 % Chloramphenicol
 Erythromycin .(Reina et al., 1994)
C.jejuni 2000 Saenz
C.jejuni % 3.2
 .(Aarestrup et al., 1998; Reina et al., 1994)
 Ciprofloxacin
 2000 Seanz % 11.1
 1987 % 72
 1988
 % 50-19 % 8-3 .1991 1989
 .(Mirelis et al.,1993)
 (Gaudreau and Gilbert., 1998)
 Campylobacter
 (Sijogren et al.,1992; Nachamkin, 1994; Hirschl et al., 1990)
 .(Harnett et al., 1995) 80%
 Ampicillin *C.jejuni*
 β-lactamase
 .(Tajada et al., 1996; Lachance et al., 1993)

C.jejuni :2

				<i>I</i>		
%		%				
33.3	3	66.7	6	10	GN	Gentamycin
0	0	100	9	30	T	Tetracycline
44.4	4	55.6	5	30	C	Chloramphenicol
11.1	1	88.9	8	15	E	Erythromycin
0	0	100	9	30	Rf	Rifampicin
11.1	1	88.9	8	100	CIP	Ciprofloxacin
100	9	0	0	25	SXT	Co-trimoxazol
100	9	0	0	10	AMP	Ampicillin
0	0	100	9	30	N	Neomycin

Spectrum Antibiotic–Broad

Lansing et al., 1996; Yu et al.,) Narrow-spectrum Antibiotic

.(1979

Campylobacter

.(Saenz et al., 2000)

.2004

Campylobacter jejuni

- Aarestrup, F.M., Bager, F., Jensen, N.E., Madsen, M., Meyling, A. and Wegener, H.C., 1998. Surveillance of antimicrobial resistance in bacteria isolated from food animals to antimicrobial growth promoters and related therapeutic agents in Denmark. *APMIS*, Vol.106, pp.606-622.
- Bauer, A.W., Kirby, W.A.M., Sherris J.S. and Turk, M., 1966. Antibiotic susceptibility testing by a standardized single disc method. *Am J. Clin. Pathol.*, Vol.44, pp.493-496.
- Bokkenheuser, V.D., Richardson, N.J., Bryner, H.J., Roux, D.J., Schutte, A.B., Koornhof, H.J., Freiman, I. and Hartman, E., 1979. Detection of enteric *Campylobacteriosis*. *Curr. Chemother.*, Vol.10, pp.174-157.
- Bolton, F.J., Wareing, D.R.A., Skirrow, M.B. and Hutchinson, D.N., 1992. Identification and Biotyping of *Campylobacter*. *Appl. Environ. Microbiol.*, Vol.29, pp.151-161.
- Gaudreau, C. and Gilbert, H., 1998. Antimicrobial resistance of clinical strains of *Campylobacter jejuni* subsp. *jejuni* isolated from 1985 to 1997 in Quebec, Canada. *Antimicrob. Agents Chemother.*, Vol.42, pp.2106-2108.
- Harnett, N., McLeod, S., Yong, Y.A., Hewitt, C., Vearncombe, M. and Krishnan, C., 1995. Quinolone resistance in clinical strains of *Campylobacter jejuni* and *Campylobacter coli*. *J. Antimicrob. Chemother.*, Vol.36, pp.269-270.
- Harvey, S.M., 1980. Hippurate hydrolysis by *Campylobacter fetus*. *J. Clin. Microbiol.*, Vol.11, pp.435-437.
- Hebert, G.A., Hollis, D.G. and Weaver, R.E., 1982. 30 years of *Campylobacter*: Biochemical characteristics and a biotyping proposal for *Campylobacter jejuni*. *J. Clin. Microbiol.*, Vol.15, pp.1065-1073.
- Hirschl, A.M., Wolf, D., Berger, J. and Rotter, M.L., 1990. In vitro susceptibility of *Campylobacter jejuni* and *Campylobacter coli* isolated in Australia to erythromycin and ciprofloxacin. *Zentbl. Bakteriologie*, Vol.272, pp.443-447.
- Hwang, M. and Ederrer, G.M., 1975. Rapid hippurate hydrolysis method to presumptive identification of group B streptococci. *J. Clin. Microbiol.*, pp.114-115.
- Lachance, N., Gaudreau, C., Lamothe, F. and Turgeon, F., 1993. Susceptibilities of β -lactamase- positive and-negative strain of *Campylobacter coli* to β -lactam agents. *Antimicrob. Agents chemother.*, Vol.37, pp.1174-1176.

- Lansing, P.M., John, H.P. and Donald, K.A., 1996. Microbiology. The Gran Hill Comp. USA.
- Lior, H., Woodward, D.L., Edgar, J.A., Laroche, L.J. and Gill, P., 1982. Serotyping of *C.jejuni* by slide agglutination based on Heat-labile Antigenic factors. J. Clin. Microbiol., Vol.15, pp.761-768.
- Mims, C.A., Playfair, J.H.L., Roitt, I.M., Wakelin, D. and Williams, R., 1995. Medical Microbiology. Mosby. USA. Chapter 35, pp.1-6.
- Mirelis, B., Miro, E., Navarro, F., Ogalla, C.A., Bonal, J. and Prats, G., 1993. Increased resistance to quinolone in catalonia, Spain. Diagn. Microbiol. Infect. Dis., Vol.16, pp.137-139.
- Nachamkin, I., 1994. Antimicrobial susceptibility of *Campylobacter jejuni* and *Campylobacter coli* to ciprofloxacin, erythromycin and tetracyclin from 1982 to 1992. Med. Microbiol. Lett., Vol.3, pp.300-305.
- Newell, D., On, S., Madden, R., Wagenaar, J., Duim, B. and Plas, J., 2001. The Genus *Campylobacter*. What is typing? CAMPYNET committee, web site: <http://campynet.vetinst.dk/typing.htm>.
- Pigran, C., Bartolome, R., Almirante, B., Planes, A.M., Gavalda, J. and Pahissa, A., 1997. Bacteremia due to *Campylobacter* species: Clinical findings and antimicrobial susceptibility patterns. Clin. Infect. Dis., Vol.25, pp.1414-1420.
- Reina, J., Ros, M.J. and Serra, A., 1994. Susceptibilities to 10 antimicrobial agent of 1220 *Campylobacter* strains isolated from 1987 to 1993 from feces of pediatric patients. Antimicrob. Agents Chemother., Vol.38, pp.2917-2920.
- Saenz, Y., Zarazaga, M., Lantero, M., Gastanares, M.J., Baquero, F. and Torres, C., 2000. Antibiotic resistance in *Campylobacter* strains isolated from animals, foods and humans in Spain, 1997-1998, pp.267-271.
- Sijogren, E., Kaijser, B. and Werner, M., 1992. Antimicrobial susceptibilities of *Campylobacter jejuni* and *Campylobacter coli* isolated in Sweden: a 10-year follow-up report. Antimicrob. Agents chemother., Vol.36, pp.2847-2849.
- Skirrow, M.B. and Benjamin, J., 1980. Differentiation of enteropathogenic *Campylobacter*. J. Clin. Pathol., Vol.33, pp.1122.
- Tajada, P., Gomez-Garces, J.L., Alos, J.I., Balas, D. and Cogollos, R., 1996. Antimicrobial susceptibilities of *Campylobacter jejuni* and *Campylobacter coli* to 12 β -lactam agents and combinations with β -lactamase inhibitors. Antimicrob. Agents Chemother., Vol.40, pp.1924-1925.
- Talaro, K. and Talaro, A., 1996. Foundation in Microbiology 2nd ed., Times Mirror Higher Education Group .Inc., USA. p. 353 .
- Vandepitte, L., Engbac, K., Piot, P. and Heuch, C.C., 1991. Basic Laboratory Procedures in Clinical Bacteriology. World Health Organization, Geneva, pp.84-90.
- Velazquez, J.B., Jimenez, A., Chomon, B. and Villa, T.G., 1995. Incidence and transmission of antibiotic resistance in *Campylobacter jejuni* and *Campylobacter coli*. J. Antimicrob. Chemother., Vol.35, pp.173-178.
- Yu, V.L., Oakes, A., Axnick, K.J. and Merigan, T.C., 1979. Patient factors contributing to the emergence of Gentamycin Resistant *Serratia marcescens*. Am. J. Med., Vol.66, pp.468-472.