TOXINS IN CULTURE FILTRATES OF C JEJUNI AND C COLI

Toxin positive	C jejuni		C coli	
	Human (n=45)	Non-human (n=7)	Human (n=32)	Non-human (n=12)
Toxin negative	3 (7%)	0	3	2
CTox+/CTox+	26 (58%)	5 (71%)	24 (75%)	4 (33%)
CTox+/CTox+	14 (31%)	2	4 (13%)	1
CTox+/CTox-	2	0	5 (9%)	5 (42%)

CTox+ = cytotoxic; CTox+ = cytotoxic

the presence of toxins in both biphasic culture supernatants and polymyxin-B-released material. We cannot agree with the general statement made by Wadström et al[2] that, based on a limited sample, toxin-producing strains are uncommon in Europe, Asia, and Africa. Our studies included toxin-producing strains of *C jejuni* and *C coli* isolated in several European countries in addition to our Canadian isolates.

The clinical significance of toxin-mediated diarrhoeal response in the pathophysiology of campylobacteriosis remains to be established. In our study, we have encountered a high frequency of toxigenic strains in a wide variety of serotypes and no direct relationship between serotype, biotype, and toxigenicity is evident at the present time.

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URINARY COTININE AS MARKER OF BREATHING OTHER PEOPLE'S TOBACCO SMOKE

SIR,—One difficulty with the study of hazards associated with breathing other people's smoke ("passive smoking") is the lack of a measure of exposure that is sensitive and specific enough for any association with disease to be demonstrable. Surprisingly, a crude measure of exposure (enquiry about the smoking habits of the spouses of non-smokers) has been associated with positive results in three[1-3] of the four[1-4] epidemiological studies reported; all three were consistent with an increase of about 50% in the risk of lung cancer. We wondered if measurement of urinary cotinine, a metabolite of nicotine, would be useful as a marker of exposure to other people's smoke.

151 men who attended the BUPA Medical Centre in London and 70 colleagues in Oxford who were not current smokers completed a questionnaire on their exposure to other people's smoke and also provided a urine sample. They were asked if they had been exposed to other people's tobacco smoke within the past 7 days (including the day of attendance); if they had they were asked about the duration of exposure during which the smoke could be smelled. Urinary cotinine was measured by radioimmunoassay as previously described using an iodine-125 label,[5] but with three modifications: (i) ammonium sulphate to separate bound from free label since this was simpler and less expensive than using a second antibody, (ii) 5% horse serum/barbitone (pH 9) as the assay buffer, and (iii) horse serum as the diluent for the cotinine standards. Horse serum was used instead of human serum to ensure that the buffer and the standard contained no cotinine. Cotinine levels were also measured for 232 men (all from BUPA) who were current smokers.

We found a dose-response relation between the mean urinary [redacted]). The median level among non-smokers was also much lower than that found among current smokers (table II). There was substantial separation between cotinine levels in non-smokers who were not exposed to other people's smoke and in current smokers (table III). There was, however, some overlap between the non-smokers who reported exposure to other people's smoke and the active smokers.

Urinary cotinine seems to be a sensitive marker of exposure to other people's tobacco smoke. It is also likely to be specific since cotinine is the major metabolite of nicotine and is derived from tobacco only. The half-life of cotinine in blood is about one day, so urinary cotinine levels might therefore be expected to reflect

TABLE I—URINARY COTININE (ng/ml) IN NON-SMOKERS ACCORDING TO NUMBER OF REPORTED HOURS OF EXPOSURE TO OTHER PEOPLE'S TOBACCO SMOKE WITHIN THE PAST SEVEN DAYS (INCLUDING DAY URINE SAMPLE WAS COLLECTED)

Duration of exposure			
Quintile	Limits (h)	No	Urinary cotinine (ng/ml) mean* ± SD
1st	0·0–	45	2·8 ± 3·0
2nd	1·5–	45	3·4 ± 2·7
3rd	4·5–	43	5·3 ± 4·3
4th	8·0–	43	14·7 ± 19·5
5th	20·0–80·0	45	29·6 ± 73·7
All	0·0–80·0	221	11·2 ± 35·6

*Trend with increasing exposure was significant ($p \leq 0.01$).

TABLE II—MEDIAN URINARY COTININE CONCENTRATION (AND 10th AND 90th PERCENTILE) IN NON-SMOKERS AND SMOKERS

Smoking category	No	Urinary cotinine concentration (ng/ml) 10th percentile	Median	90th percentile
Non-smokers				
No exposure to other people's smoke	22	0·0	2·0	6·5
Exposed to other people's smoke	199	1·4	6·0	22·0
All	221	1·0	4·0	17·0*
Smokers				
Cigarettes only	151	937	1645	3326
Cigars only	99	61	396	2138
Pipes only	42	1808	1920	4569
All	232	175	1474	3398

TABLE III—DISTRIBUTION OF URINARY COTININE (ng/ml) LEVELS IN NON-SMOKERS AND SMOKERS ACCORDING TO EXTENT OF EXPOSURE TO OTHER PEOPLE'S TOBACCO SMOKE (NON-SMOKERS) AND ACCORDING TO TYPE OF TOBACCO SMOKED (SMOKERS)

Urinary cotinine (ng/ml)	Non-smokers: Exposure to other people's tobacco smoke			Smokers		
	0 h/week	≤7 h/week	>7 h/week	Cigarettes only	Cigars only	Pipes only
<1·0	5	14	1	0	0	0
1·0–	6	8	5	0	0	0
3·0–	9	16	11	0	0	0
6·0–	3	16	26	1	0	0
12·0–	1	10	26	0	1	0
24·0–	0	0	14	1	2	0
48·0–	0	0	6	1	4	0
96·0–	0	0	4	1	5	0
192·0–	0	0	0	4	15	2
384·0–	0	0	2	4	5	2
768·0–	0	0	0	17	8	3
1536·0–	0	0	0	17	12	17
3072·0–	0	0	0	40	7	14
6144·0 or more	0	0	0	6	0	4
All	32	102	97	131	59	42

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