

Helicobacter pylori colonization density and gastric histopathology in a Northern Canadian community

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BACKGROUND

Aklavik H pylori Project

- Aklavik, NWT, Canada (population: ~600)
- Established in 2007
- Goals:
 - ❖ Investigate H pylori (HP) infection in Aklavik
 - ❖ Include community members in research planning and conduct
 - ❖ Develop effective activities to inform community members of research results



AIMS

- To characterize HP density in Aklavik participants
- To estimate associations between HP density and histopathological outcomes

METHODS

Participant Recruitment

- January – February 2008
- Aklavik HP Project participants, who had previously completed clinical surveys and/or urea breath tests, were offered endoscopy with biopsy
- Of 379 participants, 200 consented to endoscopy, 192 had analyzable data

Endoscopy with Biopsy

- Olympus N180 4.9 mm ultrathin transnasal gastroscopes
- Unsedated procedure with topical anaesthetic
- 5 gastric biopsies: 2 antrum, 1 incisura, 2 body
- Hematoxylin & Eosin (H&E) and Giemsa stains

Biopsy Evaluation

- Updated Sydney System (Dixon et al. 1996) used to classify gastric histopathology
- 0-3 Graded Scale (0=none, 1=mild, 2=moderate, 3=marked) used to classify HP density and severity of histopathologic outcomes:
 - ❖ Chronic Inflammation (Mononuclear leukocytes)
 - ❖ Acute Inflammation (Neutrophil activity)
 - ❖ Glandular Atrophy
 - ❖ Intestinal Metaplasia

RESULTS

Table 1: Participant characteristics (n=192)

Age range	10- 80 years
Sex	57% female
Ethnicity	91% Aboriginal

Table 2: Prevalence of H pylori by density grade

		number positive	% positive
HP+		127	66
HP density grade	0=none	65	34
	1=mild	32	17
	2=moderate	48	25
	3=marked	47	24

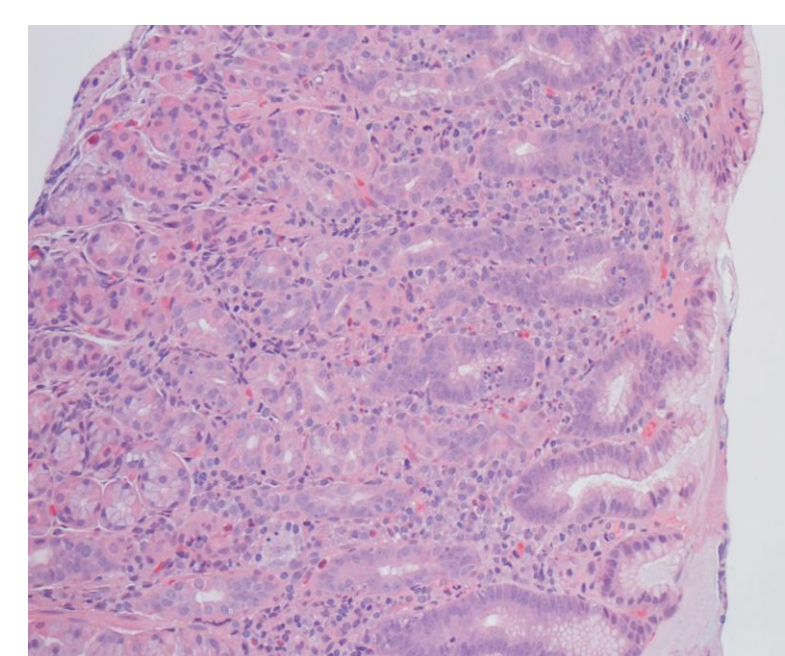


Fig 1: Antral biopsy with H&E stain showing H. pylori gastritis

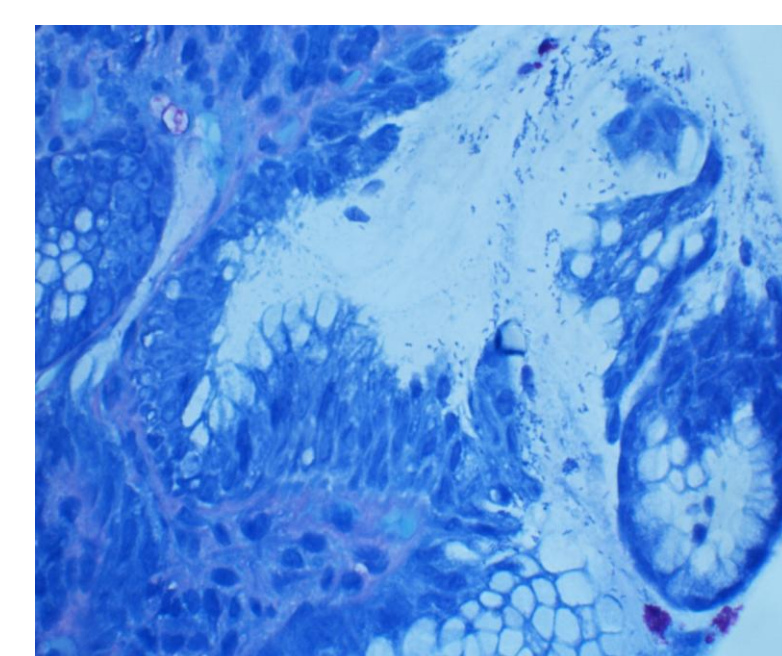


Fig 2: Antral biopsy with Giemsa stain showing H. pylori organisms

Table 3: Prevalence (%) of histopathologic outcomes by H pylori density grade

	HP density grade			
	0	1	2	3
Chronic Inflammation	5	100	100	100
Acute Inflammation	0	81	100	100
Atrophy	0	6	19	34
Metaplasia	3	16	10	8

Chronic Inflammation

- All HP+ participants had some degree of chronic inflammation
- Linear regression showed evidence of a positive dose-response effect of HP density on severity

Acute Inflammation

- All participants with HP density grade ≥ 2 had some degree of acute inflammation
- Linear regression showed evidence of a positive dose-response effect of HP density on severity

Glandular Atrophy

- Evidence of positive dose-response effect of HP density on atrophy grade

Intestinal Metaplasia

- No dose-response effect observed; uncertain conclusion due to few cases

Table 4: Prevalence of histopathologic severity grade by H pylori density in 127 H pylori-positive participants

Severity Grade	HP density grade		
	1 % of 32	2 % of 48	3 % of 47
Chronic Inflammation			
0	0	0	0
1	31	0	0
2	60	69	19
3	9	31	81
Trend: linear regression of chronic inflammation grade on density grade: $\beta = 0.51$ (95% CI: 0.40-0.62)			
Acute Inflammation			
0	19	0	0
1	75	85	23
2	6	15	60
3	0	0	17
Trend: linear regression of acute inflammation grade on density grade: $\beta = 0.54$ (95% CI: 0.43-0.67)			
Atrophy			
0	94	81	66
1	6	15	32
2	0	4	0
3	0	0	2
Trend: chi-square test for linear trend of atrophy prevalence (all grades combined) across density grades: p-value= 0.03			
Metaplasia			
0	84	90	92
1	13	6	6
2	3	4	0
3	0	0	2
Trend: chi-square test for linear trend of metaplasia prevalence (all grades combined) across density grades: p-value= 0.35			

CONCLUSION

Our analysis shows an association between HP density and the severity of inflammation, both acute and chronic, and atrophy in this Northern Canadian Aboriginal population.

REFERENCE

Dixon MF, Genta RM, Yardley JH, et al. Classification and grading of gastritis. The updated Sydney system. AM J Sur Path. 1996;20:1161- 81.

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