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Redefining *H . pylori* Diagnostics : A Transformation in Detection , Virulence Profiling and Risk Assessment Using Non-Invasive Saliva-Based Multiplex Polymerase Chain Reaction Assay in Patients With Dyspepsia

Jan Mohammad Z [1], Khan Mushtaq A [1], Bashir Gulnaz [2], Ahangar Irfan N [2], Jan Mohammad O [3], Farooque Mehwish [4].

[1]Department of Gastroenterology, Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Srinagar, Jammu and Kashmir, India

[2] Department of Microbiology, Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Srinagar, Jammu and Kashmir, India

[3] Second Affiliated Hospital, Harbin Medical University, Harbin, Heilongjiang, China

[4] Department of Anesthesiology, Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Srinagar, Jammu and Kashmir, India

INTRODUCTION

- *Helicobacter pylori* is a key etiological agent for peptic ulcer disease and gastric cancer.
- Currently Invasive endoscopic gastric biopsy is the standard for diagnosis.
- Saliva-based multiplex PCR, however, offers a non-invasive alternative for detection of *H. pylori* and identification of its virulent genotypes.

AIMS

- Evaluate the diagnostic and risk-assessment utility of multiplex PCR in saliva and gastric biopsy for detection and genotyping of *H . pylori.*
- Compare saliva as a non-invasive diagnostic alternative to biopsy.

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METHODS

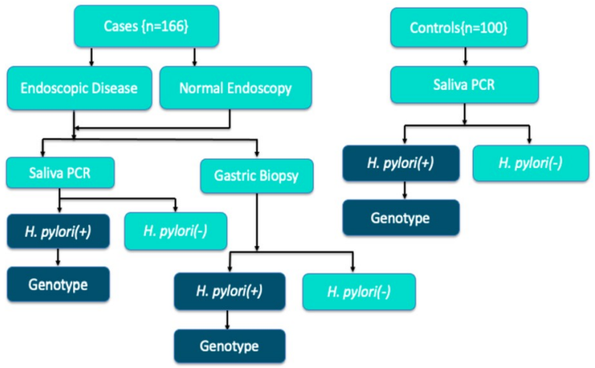


Figure 1. Study Design and Flowchart: *H. pylori* detection and genotyping using saliva PCR and gastric biopsy in dyspeptic patients and controls. PCR, polymerase chain reaction.

- Single-center observational cross-sectional study conducted between 01/04/2023 to 31/08/2024 at SKIMS.
- 166 Cases above age 18 fulfilling diagnostic criteria of dyspepsia.
- 100 Age-and sex-matched healthy controls.

RESULTS

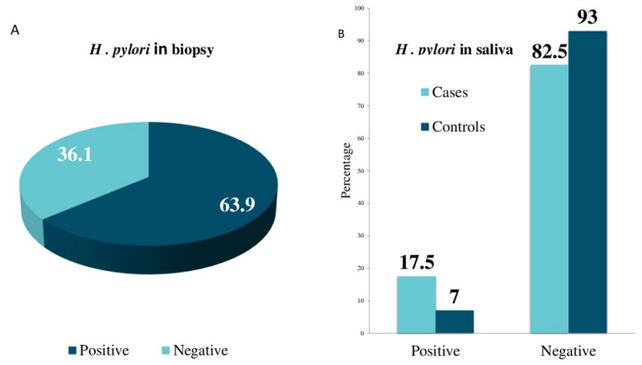
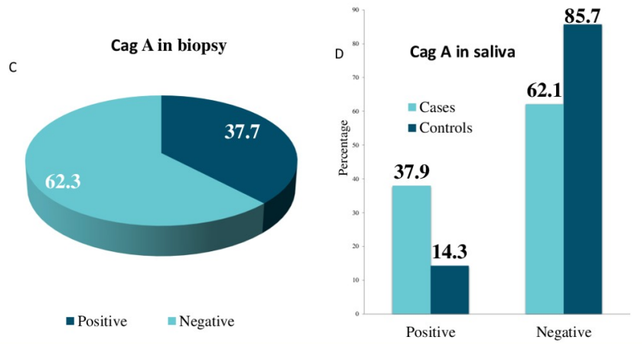
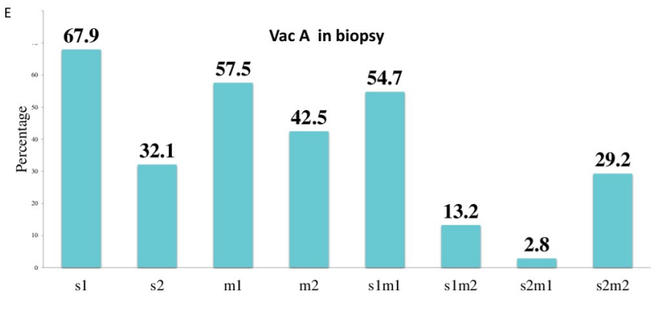


Figure 2. Proportion of *H. pylori* positivity in gastric biopsies among study cases(A). Comparison of *H. pylori* positivity in saliva samples between cases and controls(B).





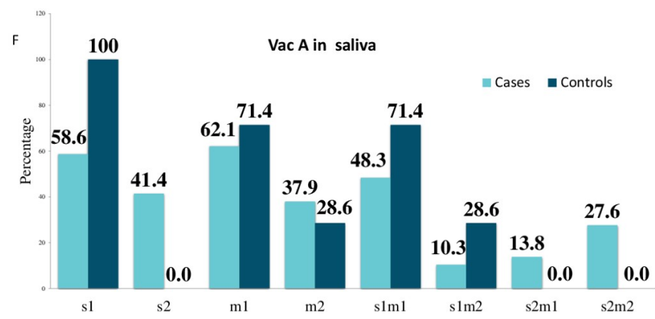


Figure 3. *Cag A* detection status in gastric biopsies of study cases(C). *Cag A* detection status in saliva samples of cases and controls(D). Distribution of *Vac A* genotypes (*s1, s2, m1, m2, s1m1, s1m2, s2m1, s2m2*) in gastric biopsies among study cases(E). Distribution of *vac A* genotypes in saliva samples of cases and controls(F).

Table :Detection and distribution of H. pylori and its virulence genes by multiplex biopsy PCR in patients with various gastro-duodenal disease outcomes

	Normal mucosal[n=45]	Antral gastritis [n=46]	Pangastritis [n=25]	Antral and corpus gastritis [n=19]	Corpus and fundal gastritis [n=8]	Fundal gastritis [n=7]	Fundal and antral gastritis [n=6]	Corpus gastritis [n=5]	Gastro duodenitis[n=5]	P-value
H. pylori positive	11 (24.4)	32 (69.6)	19 (76)	18 (94.7)	7 (87.5)	6 (85.7)	5 (83.3)	3 (60)	5 (100)	<0.001*
cag A	2 (4.4)	11 (23.9)	13 (52)	7 (36.8)	1 (12.5)	1 (14.3)	2 (33.3)	2 (40)	1 (20)	0.002*
s1	7 (15.6)	24 (52.2)	15 (60)	11 (57.9)	5 (62.5)	4 (57.1)	2 (33.3)	2 (40)	2 (40)	0.005*
s2	4 (8.9)	8 (17.4)	4 (16)	7 (36.8)	2 (25)	2 (28.6)	3 (50)	1 (20)	3 (60)	0.045*
m1	6 (13.3)	20 (43.5)	13 (52)	9 (47.4)	5 (62.5)	2 (28.6)	2 (33.3)	2 (40)	2 (40)	0.025*
m2	5 (11.1)	12 (26.1)	6 (24)	9 (47.4)	2 (25)	4 (57.1)	3 (50)	1 (20)	3 (60)	0.025*
s1m1	6 (13.3)	19 (41.3)	11 (44)	9 (47.4)	5 (62.5)	2 (28.6)	2 (33.3)	2 (40)	2 (40)	0.056
s1m2	1 (2.2)	5 (10.9)	4 (16)	2 (10.5)	0 (0)	2 (28.6)	0 (0)	0 (0)	0 (0)	0.235
s2m1	0 (0)	1 (2.2)	2 (8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.517
s2m2	4 (8.9)	6 (13)	3 (12)	7 (36.8)	2 (25)	2 (28.6)	3 (50)	1 (20)	3 (60)	0.016*

*Statistically Significant (P-value<0.05

CONCLUSIONS

- Saliva-based multiplex PCR offers a non-invasive approach for *H. pylori* detection and genotyping.
- Its lower sensitivity compared to biopsy PCR limits its role as a standalone diagnostic tool.
- Saliva PCR demonstrates potential in detecting virulent strains (e.g., *cag A, vac A*) linked to clinically significant severe gastroduodenal disease.
- It may serve as a valuable tool for risk stratification, especially in settings where endoscopy is declined, relatively contraindicated or not feasible.

KEY TAKEAWAY

When endoscopy is declined or simply not feasible, saliva PCR still remains clinically reliable.

ACKNOWLEDGEMENTS

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Email : zubair.0221753@gmail.com

Location

SCAN ME

Poster Data

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