

Helicobacter pylori : PCR v. Culture, A case study at CHU Mustapha Bacha Algiers, Algeria.

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Abstract

The establishment for the first time of the diagnosis of *H. pylori* in the Microbiology Laboratory of the University Hospital (CHU) Mustapha Bacha of Algiers, Algeria has enhanced the routine diagnosis, allow to understand the prevalence of *H. pylori* infection and its resistance to clarithromycin molecule used in its treatment in Algeria. In this work, we aimed at comparing the results of both phenotypic and molecular diagnosis methods and assess the performance of each technique.

A total of 162 pairs of gastric biopsies were collected from upper-endoscopy procedures in University Hospital Gastroenterology Department. One pair of biopsy was used for culture and the other was used to practice a multiplex PCR using Scorpions primers for the detection of *H. pylori* and the gene mutations in the 23S RNA conferring resistance to clarithromycin (A2143G, A2142G, A2142C). We aimed at comparing the results of both diagnostic techniques.

The detection of *H. pylori* were of 28% by culture and by 52.5% by PCR. PCR allowed the detection of *H. pylori* in 51% of the culture cases when negative or contaminated - This being mainly due to the bacterium cultivation and transport difficulties, limiting the performance and sensitivity of the culture. However we recorded 3 cases of false negative PCR - Probably due to PCR inhibition reasons. Only 17 cases of CMI-Study by E-test (38%) could be performed using 5 cases (29.4%) of clarithromycin resistance; however multiplex PCR showed 29 resistance cases (34%) among which the primary clarithromycin resistance accounted for 31%, the A2143G mutation was predominant at 83% and 09 cases of double population (susceptible and resistant) were found.

In a Medical Laboratory the diagnosis of *H. pylori* by PCR is interesting to consider because it provides fast and highly-accurate results, compared the culture approach, and this despite its specificity. Multiplex PCR also has the advantage of giving results of the detection of *H. pylori* and its resistance to clarithromycin.

Introduction

Bacteriological diagnosis of *H. pylori* from gastric biopsies is an essential tool to help better therapeutic management of patients with gastroduodenal diseases. Culture is a simple method and extremely specific but the sensitivity is dependent pre-analytical conditions and their response delay is long. the development of molecular techniques has improved performances of this diagnosis.

Objectif

Compare results phenotypic diagnostic techniques (culture and MIC) to molecular technique (Multiplex PCR real time).

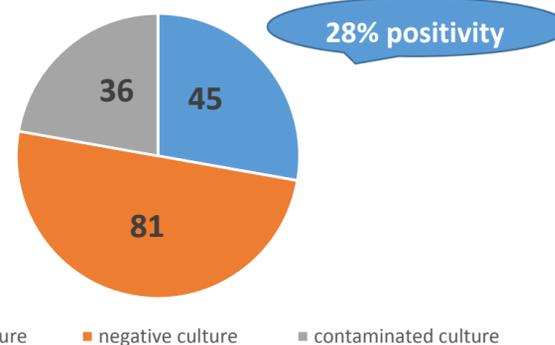


Methods

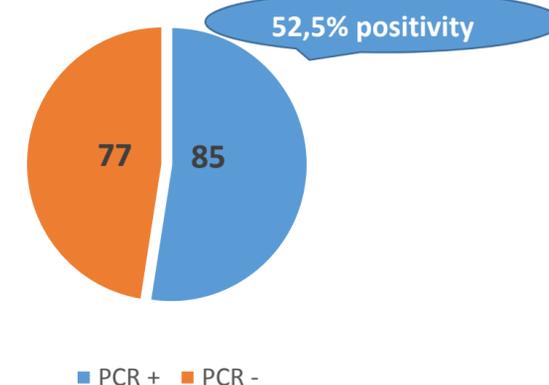
A total of 162 pairs of gastric biopsies were collected from upper-endoscopy procedures in University Hospital Gastroenterology Department. One pair of biopsy was used for culture on Columbia blood media with Dent supplement and incubated on microaerophile atmosphere until 12 days; the MICs were performed on Muller Hinton blood media according to the recommendations of the CLSI. The other was used to practice a multiplex PCR using Scorpions primers for the detection of *H. pylori* and the gene mutations in the 23S RNA conferring resistance to clarithromycin (A2143G, A2142G, A2142C).

Results

Culture results N=162



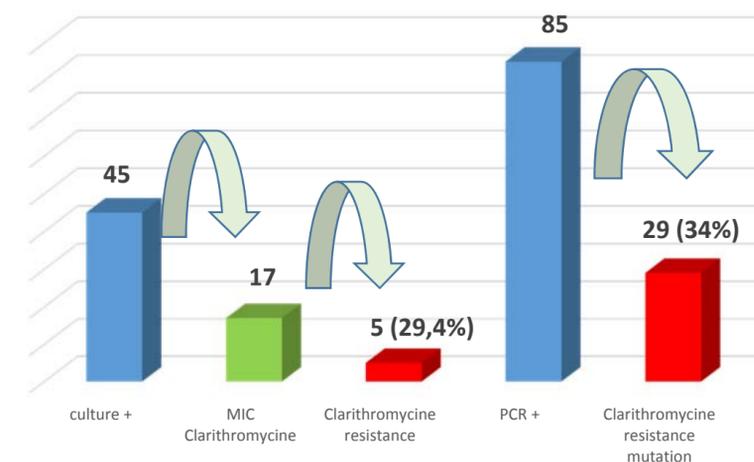
PCR multiplex results N=162



PCR v. Culture

		Culture (N=162)			
		Positive N(%)	Negative N(%)	Contaminated N(%)	
Multiplex PCR (N=162)	Multiplex PCR Positive	42	25	18	85 (52,5%)
	Multiplex PCR Negative	03 (4%)	56	18	77 (47,5%)
		45 (28%)	81 (50%)	36 (22%)	

Clarithromycine resistance detection N=162



PCR results

Multiplex PCR (N)	PCR + (N)	Resistance mutation to Clarithromycin N(%)	Primary resistance Clarithromycin N(%)	Resistance mutation	Double population (susceptible and resistance)
162	85	29 (34%)	26 (31%)	83% : A2143G	09

Conclusion

PCR allowed the optimization of *H. pylori* detection rate and resistance to clarithromycin and seems to be more sensitive and faster than culture for diagnosis