

NEW CLASSIFICATION OF VIBRIOS GROUP 1 HEIBERG

PARVIZ ADIBFAR

Vibrios are curved gram-negative, aerobic rods; they are motile, possessing a single polar flagellum. *Vibrio cholerae* and related vibrios cause cholera in humans. Other vibrios may cause sepsis or enteritis (14).

Cholera is a disease that appears with diversified intensity ranging from typical or "classical" or "textbook" manifestation through simple diarrhea to the symptomless carrier status.

The disease Cholera may be defined as an acute endemic or epidemic diarrhea often with vomiting and muscle cramps, but with little or no abdominal pain and accompanied by loss of water and electrolytes but not of protein, leading to dehydration and shock if untreated in a number of instances, but with a mild course in the majority of cases.

The name "Cholera" which is called "Vaba" in Persian is derived either from the Hebrew "Kholira": bad pain, or from the Greek "Cholera": (roof) gutter, rather than from Chole: bile or Cholas: intestine.

Some countries give preference to original national names such as Duba in Arabic, Hija in Hindustani, Olau-

Professor, Department of Microbiology, Faculty of Medicine, University of Tehran

tha in Bengali, Enerum Vandee in Tamil, Ho Luan in Chinese, and Hi Wa Ta Ka Rok in Thai (9).

Divine association is often invoked. The Hindu goddess of Cholera is Oladevi, but in northern India she is sometimes replaced by Shitala, originally the goddess of smallpox.

Choleriform or Choleroid disease is the designation of condition that appear to be like or to resemble Cholera.

Cholerin is most often used to designate the milder clinical form of Cholera.

Castellani and Chalmers (6) are the terms used to describe the form of Cholera caused by cholera Vibrios. The term Paracholera is used for Cholera like conditions due to other than Cholera Vibrios, principally to be called nonagglutinated Vibrios (N.A.G.), some of which may cause disease in man.

The term Pseudocholera of Castellani and Chalmers (6) covers Choleroid condition caused by organisms other than Vibrios. It is applicable to most instances of Cholera nostra, including Cholera infant.

According to Heiberg (12) classification Vibrios are divided into VI groups based on ability to ferment Mannose, Sucrose and Arabinose, these now actually constitute VIII groups.

Vibrio Cholerae and Eltor which are pathogenic for man are classified in group 1 (12) however, Arabinose positive has been isolated from cholera patients. Gardner and Venkatraman (10) systematically studied Vibrios and divided them into three serological groups according to their somatic or "O" antigen. True Cholera Vibrios and

Eltor biotype having the same antigenic structure were classified in serological group O₁, which consists of organisms sharing either the antigen of the so called Ogawa (AB) or of the Inaba (AC) type, the third commonly recognised serologic structure is that of the Hikojima type (ABC).

Vibrio Eltor closely resembles Vibrio cholerae, both organisms exhibit the general characteristics of Vibrios the biochemical reaction of Heiberg group 1, and agglutinability by Cholera O serum.

The differences in the haemolytic activities of the two Vibrios namely Eltor and classical Cholera is used as a criterion for differentiating them(15); the Eltor Vibrio being haemolytic for sheep or goat erythrocytes in the Greig(11) test, while the classical cholera Vibrio are non haemolytic. This hemolysis must be observed in the test tube and not on the blood agar plates.

In recent years it has been observed (2) that the Vibrio responsible for the last pandemic of cholera does not possess Haemolytic activity and this has caused a lot of controversies.

Some investigators like Sakazaki et al (18) suggested non haemolytic strains should not be designated as Vibrio cholerae biotype Eltor. The name "Biotype Eltor" was proposed to designate haemolytic strains of Vibrio cholera by the International Sub-Committee on Taxonomy of Vibrios.

Since the haemolytic activity could not be served as a factor for distinguishing Eltor from cholera.. other suggestions were proposed, among which Mukerjee (16) proposed the resistance to phage IV. Finkelstein (7) at the same time suggested Chick red Cells Agglutination(C. C.A), and Powell (17) considered that antibiotic resistance.

Other investigators proposed various methods among which was the addition of glycerol(15) which gave the positive results of hemolysis in previously negative strain or addition of Ca and Citrate converted hemolysis positive strain to negative (5).

Simillary new classifications have been proposed mainly that of Feeley (8) who divided the group I Heiberg into five biotypes according to the haemolytic activity, resistance to phage IV and polymyxin B, C.C.A. and Voges Proskauer (V.P.) test.

We decided to investigate further differences between cholera and Eltor. We experienced all the above mentioned methods (3) of classification and came to the conclusion that the only reproducible method was that of haemolytic activity of Greig with sheep Red Blood Cells.

The use of Pyrolysis-gas-liquid chromatography (13) which can serve as a classification procedure has been recently considered. Pyrochromatograms may be divided into complexes of individual peaks. The complexes were numbered and the peaks were lettered. The most significant complex for identification of Vibrios is complex 7 which consists of two major peaks A and B with two minor peaks. Peaks 7B were always present in non Vibrios and Vibrios(non Vibrios tested, Aeromonas,Pseudomons, Escherichia, Salmonella, Shigella, Proteus) but not peak A. In Vibrios cholerae classical biotype A peak is smaller than B. In Vibrios cholerae biotype Eltor A peak is larger than B. In Vibrio Eltor which is haemolytic negative (Intermediate biotype) A and B showed similar size.

According to these findings the group I Heiberg can be divided into three biotypes (2), classical, Intermedia-

te and Eltor. The intermediate biotype is quite similar to biotype Eltor with the differences of the presence of haemolytic activity in biotype Eltor.

These three biotypes are similar as far as antigenic determinants are concerned. Also these three biotypes have some differences in the morphology and gram staining properties(4). The classic form is very thin and cannot be stained by fuchsin for ten seconds and at least 30 seconds is required to stain it. On the other hand the biotype Eltor is thicker and easily stained in 10 seconds, but non haemolytic Eltor is an intermediate between these two biotypes.

Therefore, non haemolytic Eltor, responsible for the recent pandemic, is an intermediate of these two biotypes.

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