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Chikungunya Disease: Infection Associated with Atypical Presentation of Duodenal Perforation

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ABSTRACT

Background: Chikungunya is a rare epidemic disease associated with atypical duodenal perforation which initiated us to conduct the study. To determine the association of Atypical Slit like Duodenal perforation in Chikungunya disease compared to duodenal perforation in Non-Chikungunya group and to see the postoperative surgical site infection and mortality in both the groups. **Methods:** This comparative cross-sectional study was conducted in Jinnah Postgraduate Medical Centre, from November 2016 till August 2017 and consecutive convenient sampling technique was utilized. Patients with peritonitis secondary to duodenal perforation were included. Patients of Duodenal perforation with Chikungunya were placed in group A and without Chikungunya were in group B. ELISA was sent to confirm IgM antibodies. Duodenal perforations were diagnosed by a free gas under the diaphragm on X-ray Chest. Direct Graham's Omentopexy after taking margins of the perforation for histopathology done. **Results:** 20 to 60 years of age group was recorded in the study with a mean age of 45.366±9.25 years, and duration of peritonitis was 1.700± 0.74 days in group A and mean period of 45.400±9.23 year and time of peritonitis was 1.600± 0.72 days in group B. Majority of patients were male in both the groups. Atypical Slit like Duodenal perforation of around 1 cm in length was seen more in patients with Chikungunya i.e. 93.3% as compared to 6.7% in patients without Chikungunya (p 0.000) (O.R=196). 10% patients showed postoperative complication in group A whereas, 13.3% in group B (p 0.687) (O.R=0.722). **Conclusion:** ?.

Keywords: Chikungunya infection, acute peritonitis, Slit like Duodenal ulcer perforation.

INTRODUCTION

Chikungunya is caused by alphavirus of Togaviridae family and Aedesaegypti mosquitoes are responsible for its transmission.[1] It was first discovered in Tanzania in 1953 and it spreads in many parts of West Africa.[2] Like all arboviruses, chikungunya virus outburst during the rainy season when vector density is maximum. At hand, data suggest that chikungunya virus can be both indigenous and epidemic.[3] The term chikungunya, which is used to delineate both the virus and the infection, extracted from a Swahili or Makonde locution Kun gunwale, the denotation "to become contorted" or "that which bends up". The condition is distinguished by pyrexia, headache, myalgia, rash, and arthralgia. Although almost all symptoms subside, joint pain persists for years and can be so grievous that they acquire a bent or stooping postur.[4] The common signs of chikungunya infection are fever and disabling symmetrical polyarthralgia.[5] About in 1/3rd of patients joints may be swollen, even effusive arthritis symptom is limited.[5]

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A maculopapular rash on the face may be developed for 1 to 3 days after infection. These rashes may vanish within a few weeks, but in some cases, it may take some months to years, which may have a significant impact on the quality of life of the patients.[6] Symptoms of Chikungunya may coincide with other conditions like dengue fever and parvovirus B19 infection. That's why laboratory testing like ELISA is required to confirm immunoglobulin M (IgM) or immunoglobulin G (IgG) antibodies in serum of the patients. IgM antibodies can be detected within few days after the development of symptoms while IgG antibodies can be found during different stages of illness and can be found after years.[7] In 1979 Fourie and Morrison reported the first case of rheumatoid arthritis post chikungunya and in 1983 by Brighton et al they underlined the high prevalence of chronic polyarthralgia or stiffness articulate that appeared about 3 years after the onset of the disease resulting in injudicious use of analgesics and non-steroidal anti-inflammatory drugs provide relief in most patients.[8] Amala Keziah Vivek Kulkarni and et all reported an odd case of a 6 years old boy showing Chikungunya infection and the surgical complication of 1 cm diameter hole in the anterior wall of 1st part of duodenum. Recent studies have shown an association of duodenal ulcer with NSAIDs. This association may cause duodenal ulcer in patients with Chikungunya which in turn can cause duodenal

ulcer perforation.[9] Therefore, I have planned this study to determine the frequency of duodenal ulcer perforation with an unusual demonstration in so far identified cases of Chikungunya disease in our native.

MATERIALS AND METHODS

Figure 1: Intraoperative picture showing unusual slit-like duodenal ulcer perforation in comparison to pinpoint perforation

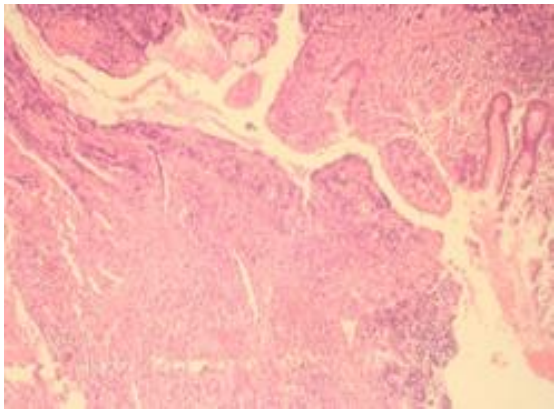

Figure 2: Duodenal ulcer perforation showing nonspecific inflammatory cells.

This was comparative cross-sectional research carried out in the tertiary care organization of Jinnah Postgraduate Medical Centre Karachi, Pakistan. The time span of statistical analysis was from November 2016 till August 2017 in the epidemic outbreak of Chikungunya Virus and consecutive convenient sampling technique was employed, after written permission by the ethical committee. Patients diagnosed with duodenal ulcer perforation presented with manifestations of acute peritonitis were incorporated in the research. All diagnosed cases of Chikungunya with acute abdomen were placed in group A and without Chikungunya and all other causes of peptic ulcer perforation were in group B. All the patients above 12 year of age, both genders, were included. The patients who on histopathology had carcinoma of the stomach were excluded. Patients with comorbid like CRF, cirrhosis and Diabetes Mellitus were excluded. Duodenal ulcer perforation was diagnosed by free gas under the diaphragm on X-ray Chest (PA view, in erect posture) in a patient with acute abdomen. Direct Graham's Omentopexy was performed, i.e. a healthy piece of Omentum is placed on the perforation site by three interrupted sutures of 2.0 synthetic absorbable material taken between the omentum and the healthy duodenum about 1cm away from the margins of the perforation. Our routine is not to take margins of the duodenal ulcer perforation for histopathology but due to atypical presentation of slit-like duodenal ulcer perforation of 1cm in length, unlike pinpoint perforation, we took margins of the perforation for histopathology which showed nonspecific inflammatory cells.

Laboratory testing i.e. ELISA, was sent to confirm immunoglobulin M (IgM) antibodies in serum of the patients with Chikungunya disease. IgM antibodies to Chikungunya virus detected which suggested the presence of recent infection in group A.

Patient's statistical, clinical, intraoperative findings and postoperative complications concerning sepsis and surgical site infection were recorded. We followed the patients for about a week for Surgical Site infections.

Details were recorded and studied using SPSS version 20. Quantitative variables like age and duration of complain were displayed in the form of mean + standard deviation. Qualitative variables like gender were presented in the form of frequency and percentages. Chi-square test was put in to collate intraoperative findings and postoperative consequences in both groups taken $p \leq 0.05$ as notable. The odds ratio was computed too.

RESULTS

Age span in the research was from 20 to 60 years with a mean age of 45.366±9.25 years, and duration of peritonitis was 1.700± 0.74 days in group A and mean period of 45.400±9.23 years and time of peritonitis was 1.600± 0.72 days in group B as shown in [Table 1].

Majority of patients were male (70%) as compared to female (30%) in group A and in group B male patients were 73.3% and female patients were 26.7% as shown below

Table 1: Mean±SD of patients according to age and duration of peritonitis in both groups n=60

Demographics		Group A Mean ± SD n=30	Group B Mean ± SD n=30
1	Age (years)	45.366±9.25	45.400±9.23
2	Duration of Peritonitis (days)	1.700± 0.74	1.600± 0.72

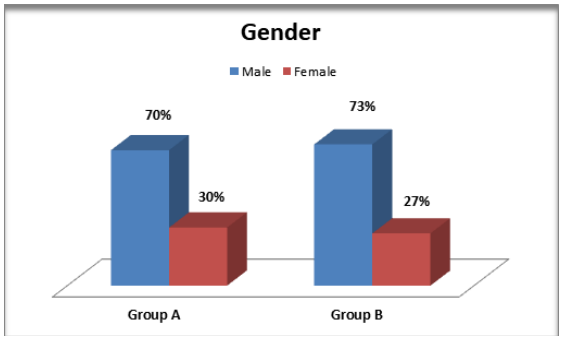

Figure 3: Bar showing the ratio of male and female in both groups

Atypical Slit like Duodenal perforation of around 1 cm in length was seen more in patients with Chikungunya i.e. 93.3% as compared to 6.7% in patients without Chikungunya(p 0.000) (O.R=196) as shown in [Table 3]

Table 2: Comparison of Atypical Slit like a perforation in both groups n=60

Atypical Slit like Duodenal perforation	Group A n=30	Group B n=30	P-Value	Odds Ratio
Yes	28(93.3%)	2(6.7%)	0.000	196.000
No	2(6.7%)	28(93.3%)		

The postoperative complication in terms of surgical site contamination was seen in 10% patients in group A in contrast to 13.3% in group B (p 0.687) (O.R=0.722) as shown in [Table 3]. The P-value indicates that there is no significant difference in postoperative surgical site contamination in both groups.

Table 3: Comparison of postoperative complication in both groups n=60

Post-Operative Surgical Site Infection	Group A n=30	Group B n=30	P-Value	Odds Ratio
Yes	3(10%)	4(13.3%)	0.687	0.722
No	27(90%)	26(86.7%)		

The mortality rate due to sepsis at presentation was noted in both the groups one patient died in group A and 2 patients died in group B which showed 1:2 of mortality rate.

ELISA was sent to confirm immunoglobulin M (IgM) antibodies in serum of the patients with Chikungunya disease. IgM antibodies found positive in 87% of the cases while it was borderline in the remaining 13% of the issues which suggested the presence of recent infection.

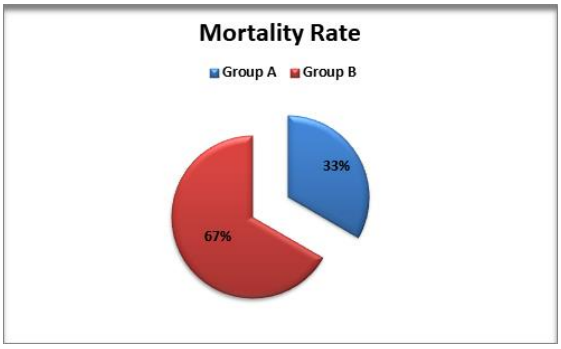

Figure 4: pie chart showing the mortality rate due to sepsis at presentation.

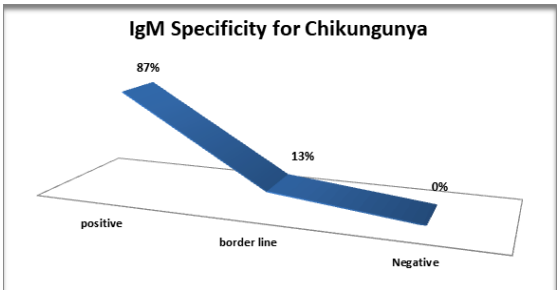

Figure 5: The positive IgM value clearly points out the acute infection at the time of surgical complication in group A.

DISCUSSION

Chikungunya infection is featured as a febrile ailment. The chief clinical manifestation broached by Robinson et al, in his original report were pyrexia, incapacitating arthralgia, myalgia, headache, and disperse maculopapular rash.[10] Other clinical variables such as diarrhoea, vomiting, continuous arthralgia, and unusual bleeding, have also been reported, during an epidemic or in cohorts of trippers. And because of the gravity of these symptoms, patients are on Nonsteroidal anti-inflammatory drugs for prolong period. Patients presented with surgical complications and mortality is not only because of excessive intake of analgesics, but the destructive course of the virus may additionally be the reason.

In 2006 Dr, Trivedi and et all highlighted the surgical complications related to Chikungunya pointing peptic ulcer perforation (19.3%), injection abscess (15.8%), acute gastritis (10.5 %), jejunal perforation (8.8%). And according to this study, surgical infections were more in males (84.2 %) in comparison to females (15.8 %) and duodenal and jejunal perforation were also higher in males than females whereas in contrast to this study our result shows female dominance in respective of duodenal ulcer perforation in Chikungunya and in our study no jejunal perforation noted.[11] The above-mentioned study showed injection abscess in 15.8% which clearly demarcate the need of I/M analgesics and NSAIDs for the severe arthralgia.[11] This study is first of its kind because in our part of the world

perforated peptic ulcer disease manifests with pinpoint perforation in the anterior wall of the first part of duodenum dissimilar to Chikungunya Disease where a slit-like duodenal ulcer perforation is seen in the anterior wall of the first part of duodenum. Atypical Slit like Duodenal perforation of around 1 cm in length was seen more in patients with Chikungunya i.e. 93.3% as compared to 6.7% in patients without Chikungunya (p 0.000) (O.R=196.00) in our study. Peptic ulcer perforation is one of the many surgical exigencies. The prime surgical intervention for perforated duodenal ulcer has been contentious. A simple repair has been frequently carried out intervention since its popularization by Graham in 1937. However, long-term reevaluation of patients with status post simple repair divulges a peak incidence of ulcer relapse. Currently, it is recommended that simple repair followed by H. pylori eradication therapy for positive cases is the top management to be done.[12] NSAIDs are the frequent stimulus of peptic ulcer disease in patients without H. pylori infection.[13] Topical effects of NSAIDs leads to submucosal erosions. Moreover, by inhibiting cyclooxygenase, NSAIDs stop the formation of prostaglandins and their protective cyclooxygenase-2–mediated impacts (i.e., enhancing gastric mucosal protection by stimulating mucus and bicarbonate secretion and epithelial cell proliferation and increasing mucosal blood flow). Coinciding H. pylori infection extends the possibility of NSAID-induced damage.[14] Although literature and consensus associate this perforation with the immoderate use of NSAIDs due to atypical manifestation of arthritis in Chikungunya disease, the unusual slit-like duodenal ulcer perforation needs to be answered.

CONCLUSION

This study has concluded that Atypical Slit like Duodenal ulcer perforation is more associated with Chikungunya disease as compared to pinpoint duodenal ulcer perforation seen in non-Chikungunya cases keeping the variable of age and gender similar and no significant difference of postoperative surgical site infection and mortality rate in both the groups.

Limitation of the Study

Although this research prepared carefully, I have come across some of its limitation and shortcomings. The study is limited in terms that irrespective of literature which is available for peptic ulcer perforation and Chikungunya we are short of any literature associating them. Another limitation was its duration and number of patients as we are bound to the epidemic of the disease for the collection of the sample.

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