Concomitant Anti-hepatitis C positivity among family members of thalassemic patients

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Summary:

Background: This study was carried out from first of June 2008 till first of June 2009 at thallassemia center Diyala governorate on families who have more than one affected member with thalassemia and other member who also gives positive results for hepatitis C infection in addition to the index (infected) case.

Material and methods: The study sample includes (13) families with (13) index cases who test positive for anti-hepatitis C antibody. Each family have at least two patients with thalassemia, the overall number is (29).

Results: This study reveals that 76.92% (10 families) have at least one more member in the same family who also test positive for anti-hepatitis C antibody. Prevalence after exclusion of index cases is 68.75%.

Conclusion: Anti-hepatitis C antibody is high among thalassemic siblings and routes of transmission of infections other than blood transfusion should be considered among thalassemic siblings.

Keywords: Hepatitis C, Thalassemia, routes of transmission.

Introduction:

Hepatitis C virus (HCV) was first characterized in 1989 (1). It is now recognized that HCV was the cause of parenterally acquired previously termed nonA-nonB hepatitis (1, 2). HCV has prevalence of 1% worldwide. Six types and about 90 subtypes have been identified (1, 2, and 3). Antibodies that develop after infection are usually strain specific (1, 2, 4) .Hepatitis C is the commonest transfusion associated infection (2, 5, 6, 7). Approximately 10% of new infections are unexplained (2). Acute infection is generally benign with more than 80% asymptomatic and un-icteric (1,4).Fulminant hepatitis is very rare (1). Chronic infection develops in over 75% of cases and leading to chronic liver disease (1, 2, and 4). However the clinical outcome is highly variable (1, 2, 3). Cirrhosis develops slowly in the majority of cases usually taking as long as 2-3 decades (2, 4). In some cases cirrhosis may develop rapidly within 1-2years of exposure, while hepatocellular carcinoma develops in 1-5% of infected individuals after 20 years , and is particularly likely after cirrhosis develops (1,4) .Other manifestations include small vessel vasculitis, arthritis, glomerulonephritis and nephrotic syndrome (1,2,7) .

The severity of chronic hepatitis may be greater because of concomitant iron overload or other concurrent infection such as hepatitis B infection (1) Antibody to hepatitis C virus (Anti-HCV) Antibody screening was started in 1990 (8). HCV-RNA in plasma is the most reliable indicator of viral activity and is detected by polymers chain reaction (PCR) (1, 2, 4, and 8), which is also used as indicator of disease progression, response to treatment, exacerbation and recurrence (1). PCR test can detect HCV-RNA in plasma or serum within 1-2 weeks and may be positive as early as three days after inoculation (4,7) .(2,4,10) Risk of viral hepatitis is about 1/ 100.000 donor exposure No vaccine or immunoglobulin to prevent hepatitis C is available to date (1,2) . PCR testing should become standard practice for early detection of HCV infection (5). All blood should be screened for HCV, nevertheless a small residual risk of infection resulting from donation during the window period (4).General measures such as avoiding sharing toothbrushes, razors, are advised to avoid transmission to family (1.2).

Material & Methods:

The sample of this study which was carried out at Thalassemia center Diyala governorate consists of 13 families who have more than one thalassemic patient in the same family and at least one index case who tests positive for AHC-Ab The total number of patients is 29. The third generation (ELISA) test (Biot) was used for detection of AHC-Ab.

Results:

The study reveals that among the total 29 patients, 24 of them are AHC- Ab seropositive which is 82.76%, as it is shown in table (1). Regarding age it is found that age group (5-9) has the highest

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frequency of seropositivity 31.03% from the total affected which is 82.76% as it is shown in table (2). About sex distribution it is found that males who test positive constitute 55.17% of cases are higher than females who test positive who constitute 27. 95% of cases as shown in table (3). Furthermore it is found that 70% of families with two thalassemic patients are positive for both of them , that is to say the index infected thalassemic patient and his thalassemic sibling tests positive for hepatitis C too , thus there is increased risk for other family member with +ve AHC-Ab among thalassemic patients families .

Table (1): General characteristics of the sample*

1-Distribution of patients according to AHC-Ab	Number	%
Positive	24	82.76
Negative	5	17.24
Total	29	100
2-Age distribution (year)		
0-4	10	34.48
5-9	11	37.93
10-14	5	17.24
15-19	1	3.45
20-24	2	6.9
Total	29	100
3-Distribution of families according to the number of thalassemic patients in the family.		
Two thalassemics	10	76.92
Three thalassemics	3	23.08
Total	13	100
4-Distribution after exclusion of index cases		
AHC-Ab positive	11	68.75
AHC-Ab negative	5	31.25
Total	16	100
5-Distribution of families according to AHC-Ab status		
AHC-Ab positive to one sibling only	3	23.08
AHC-Ab positive to two siblings	10	76.92
Total	13	100

*AHC (+): anti-hepatitis C positive, AHC (-): anti-hepatitis C negative

Table (2): Age distribution according to AHC-Ab seropositivity*

Age group(yr)	AHC (+) (%)	AHC (-) (%)	Total (%)
0-4	8(27.59)	2(6.90)	10(34.48)
5-9	9(31.03)	2(6.90)	11(37.93)
10-14	4(13.79)	1(0)	5 (17.24)
15-19	1(3.45)	0(0)	1 (3.48)
20-24	2 (6.9)	0(0)	2(6.90)
Total	24(82.76)	5(17.24)	29 (100)

Table (3): Sex distribution according to AHC seropositivity*

Sex	AHC(+ve) No.	%	AHC (-ve) No.	%	Total No.	%
Male	16	55.17	3	10.34	19	65.52
Female	8	27.59	2	6.9	10	34.48
Total	24	82.76	5	17.24	29	100

*AHC (+): antihepatitis C positive, AHC (-): antihepatitis C negative.

Table (4): Distribution of families according to AHC positivity

Family	AHC (+v e) to one sibling only	%	AHC (-v e) to two siblings or more	%	Total	%
With two infected thalasemic patients	3	30	7	70	10	100
With three thalassemic patients	0	0	3	100	3	100
Total	3	23.8	10	76.92	13	100

*AHC (+): antihepatitis C positive, AHC (-): antihepatitis C negative.

Discussion:

Failure to synthesize beta chains (B-thalassemia) is the commonest type and is seen in highest frequency in the Mediterranean area. Homozygotes (thalassemia major) are unable to synthesis hemoglobin A and after the neonatal period have profound hypochromic anemia associated with much evidence of red cell dysplasia and increased red cell destruction. An increased blood requirement due to hypersplenism accelerates iron loading, increases the risk of transfusion- mediated infection. Hepatitis C infection is a disease, which can lead to serious

problems. Acquiring the infection in the early years of life can lead to major problems in adulthood. It is shown from this study in table(2) that age group (5-9) have higher prevalence of hepatitis C and this finding is in agreement with previous two studies in both Diyala and Al-mosul which show the same finding(11). The prevalence of Hepatitis C infection among thalassemic patients is 26.2% in Diyala(11). Prevalence of hepatitis C infection among the overall sample is 82.76%. After exclusion of index cases from the sample the prevalence is 68.75% which is high. It is found also that 76.72% of these families have two or more patients with hepatitis C this high prevalence might be related to other factors other than the risk that comes from blood transfusion Other possible routes of transmission ; sharing of syringes , scalp veins , sharing of utensils, toothbrushes , and towels among these siblings. Further studies are essential in this aspect.

Conclusion:

High frequency of AHC-Ab is found among family members of thalassemic patients, more frequent with those who are thalassemic too. Further studies are recommended to establish possible routes other than blood transfusion acquired infection.

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