SURGERY: A POSSIBLE RISK FOR HEPATITIS C IN TURKEY

(A case control study)

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ABSTRACT

Objective: This study aims to investigate surgical intervention as a risk factor for HCV infection.

Methods: Eighty eight HCV positive cases and 182 HCV negative controls were compared with regards to history of operation and transfusion.

Results: History of surgical intervention was present in 51 (57.9%) in case group and 78 (42.8%) in control group. The odds ratio was 1.79 ($p<0.05$). Most frequent types of operation were gynecologic operation, apendectomy, and heart or lung operations.

Conclusion: These results suggest that surgery may be a risk for transmission of HCV in Turkey.

Key words: Hepatitis C, surgery, Transmission.

INTRODUCTION

Since the discovery of hepatitis C virus (HCV) several risk factors have been defined in the transmission of this disease. These factors although may have geographical variabilities, focuses on percutanous exposures such as transfusion of blood and blood products, organ transplantation, sharing of contaminated needles among IV drug users, acupuncture and tattooing (1, 2). Although the transmission route is often not well defined, hospitalization and surgical interventions may be important risk factors for HCV infection (3-6). Such a transmission may occur if contaminated equipment is shared between patients, but the route of nosocomial transmission is not always demonstrated.

The prevalence and epidemiology of HCV infection in Turkey is similar to European countries ranging between 0.3% to 1.8% and the major risk factor is transfusion of blood and blood products (7, 8). However neither of these risk factors is shown in many patients. Such cases may be defined as sporadic although they may have a history of surgical or dental procedures.

The history of operation as a risk factor in anti-HCV positive patients in Dokuz Eylul University Hospital is investigated in this study.

MATERIALS AND METHODS

Between 1994 and 1995 a total of 88 new cases of HCV infection were diagnosed in Dokuz Eylül University Hospital. These patients were positive for hepatitis C virus antibody (Anti HCV third generation) and/or by PCR HCV RNA (polymerized chain reaction HCV RNA). These patients were evaluated according to their history, physical examination, biochemical study and liver biopsy. Further investigations were performed if necessary. In some patients with cirrhosis, liver biopsy was not performed because of the obvious clinical picture. Data on a control group of anti HCV negative outpatients was collected. The risk factors like transfusion, IV drug using or tattooing and history of operation in case and control groups were investigated. In addition, kinds of operations requiring hospitalization were investigated in cases.

Statistical method:
The descriptive statistics of each variable were studied, with calculation of means, SD, and range. To compare the data of two groups we used Chi Squares test and calculated odds ratios (OR) in 95% confidence interval (CI). Data were analyzed using SPSS for Windows software.

RESULTS

The mean age (46 female and 42 male) in case group was 52.5±11.9. Eighty four patients were positive for anti HCV, 4 were positive only for PCR HCV RNA. Diagnoses of patients were chronic active hepatitis in 59 (67.0%), cirrhosis in 16 (18.3%) and HCC (hepatocellular carcinoma) in 3 (3.4%). Diagnosis was made clinically or by biopsy. The mean age of 182 subjects (77 female and 105 male) in the control group was calculated as 47.2±14.5.

None of the cases and controls had history of IV drug use, transplantation, hemodialysis, acupuncture and tattooing. A history of transfusion was found in 25 (28.4%) patients in the case group, that was 33 (18.1%) in the control group. Four (4.5%) patients in the case group and 7 (3.8%) patients in control had transfusion history without operation (Figure 1). None of these patients had a hematologic disorder like hemophilia requiring continuous transfusion. There was not any statistical differences between females (28.0%) and males (28.5%) regarding transfusion history (p>0.05).

History of hospitalization for operation was present in 51 patients (57.9%) in the case group and 78 (42.8%) in control group. Surgical history was not statistically different between sexes (female 54% and male 61.8%) in the case group (P>0.05). The most frequent causes of hospitalization were gynecological operations (39.3%) and appendectomies (25.9%) in female patients, and appendectomies (21.7%) and heart, lung operations (21.7%) in male patients (Table I).

In the surgical history, transfusion and hospitalization were more frequent in the case group but only operation showed a statistical significant difference (Table II).

Table I. Causes of hospitalization for operation

	Female		Male		Total	
	n	%	n	%	n	%
Appendectomy	7	25.0	5	21.7	12	23.5
Gynecological	11	39.3	-	-	11	21.6
Cholecystectomy	6	21.4	1	4.3	7	13.7
Heart, lung	-	-	5	21.7	5	9.8
Gastrectomy	1	3.6	4	17.4	5	9.8
Tonsillectomy	1	3.6	2	8.9	3	5.8
Others*	2	7.1	6	26.0	8	15.8
Total	**28**	**100.0**	**23**	**100.0**	**51**	**100.0**

*: Inguinal hernia, Urolithiasis, Orthopedic and Thyroidectomy operations.

Table II. Exposure of transfusion and operation in cases and controls

	HCV Infection (%)			
	(+)	(-)	OR (95% CI)	P
Only Transfusion	4 (4.5)	7 (3.8)	1.19 (0.28 < OR < 4.69)	0.752
Transfusion	25 (28.4)	33 (18.1)	1.79 (0.94 < OR < 3.39)	0.076
Trans+Operation	21 (23.9)	26 (14.2)	1.88 (0.94 < OR < 3.75)	0.076
Only Operation	30 (34.1)	52 (28.6)	1.29 (0.72 < OR < 2.31)	0.433
Operation	51 (57.9)	78 (42.8)	1.84 (1.06 < OR < 3.18)	0.027

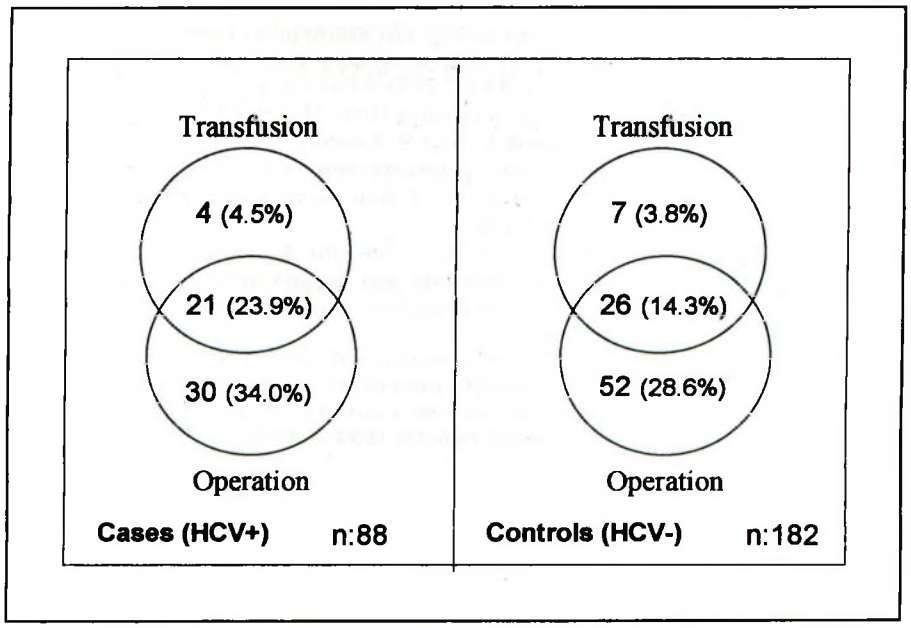

Fig. 1: Operation and transfusion history of cases and controls.

DISCUSSION

The transmission of HCV infection is mainly via percutanous exposure; transfusion of blood or blood products, IV drug use and chronic hemodialysis. These are the most efficient routes while sexual transmission, household contact and perinatal exposure may also play a role in the transmission of this infection. However 31% to 53% of patients with HCV infection have no history of percutaneus exposure. These cases are generally regarded as 'sporadic' or 'community acquired'. This is not a well defined occurrence since it may show variations due to socio-economic level of the community, methods of screening of the infection and reliability of exposure histories, etc.

There are few studies about hospitalization and operation as a separate risk factor for HCV infection. Nosocomial transmission of HCV is possible with inadequate disinfection or reuse of infected equipment on patients. Such transmission in the operation room may be most likely to occur via the anaesthetic equipment. A cluster of 5 cases of HCV among patients on the same operating list in a private hospital has been reported from Australia (9).

We found that a history of surgical intervention is a risk factor for HCV infection in this study. Among 88 HCV infected cases 30 (34%) had such a history. This infection was not simply 'sporadic' or 'community acquired' because this rate of surgical intervention was significantly higher as compared to control group and could be defined as a 'risk factor'. The most frequent operations were gynecological operations, heart-lung operations and appendectomies respectively. Similar results were reported by Mele et al from Italy where obstetric and gynecological surgical intervention was found to be strongly associated with HCV positivity (3). However, it is difficult to conclude that a specific type of operation produces higher risk in our study because the higher number of female patients may give a result with the predominance of gynecologic surgical interventions. Furthermore, appendectomy which is a simple operation and has a short duration of procedure and hospital stay was found to be the most frequent operation in males and the second frequent one in females associated with HCV infection. This may lead us to postulate that the anesthetic equipment rather than the type of operation may be the source of transmission.

The risk of infection in patients who had a history of an operation without transfusion was not different in case and control groups (Table II). This may be due to the relatively small number in the study population. However, odds ratio for surgical intervention was found higher than the one for transfusion (1.84 vs. 1.79) when calculated without separating the two factors and only the odds ratio for operation was found significant as compared to control group (Table II). The reason for finding the risk for transfusion insignificant may also be the higher rate of transfusion history in the control group.

In conclusion a history of surgical intervention as a risk factor for HCV infection should be investigated in larger groups. Routes of transmission should also be elucidated.

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