level up to 10%. This result is better than those previously reported in *E. coli* and even in yeast, which was 3% (5). The HTLV-I positive sera used in the WB recognized only the protein at the expected molecular weight (4500 Da) in the lanes corresponding to the induced clones. These results allows the production of enough quantity of core antigens from HTLV-I, which is very important for the development of diagnostic kits for HTLV-I.

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THE HEPATITIS C VIRUS INFECTION IN CUBA: ANTIBODY PATTERN AND GENOTYPES

Guillermo J. Padrón[1], Juan Roca[1], Shahid Jameel[2], Enrique Arús[3], Luis Rivera[4].

[1]*Center for Genetic Engineering and Biotechnology, Havana, Cuba.* [2]*International Center for Genetic Engineering and Biotechnology, New Delhi, India.* [3]*Hospital "Hermanos Almejeiras", Havana, Cuba.* [4]*Hospital "Carlos J. Finlay", Havana Cuba.*

INTRODUCTION

Hepatitis C virus (HCV) is the responsible of more than 90% post-transfusion hepatitis and a high proportion of chronic cases. HCV infection is a serious health problem in Cuba (Padrón *et al.*, 1994) and the knowledge of its characteristics is an important cornerstone in order to structure control strategies. The aim of the present paper is to show the serologic pattern of this infection in Cuban hepatitis patients and to report the genotypes identified in our carriers.

MATERIALS AND METHODS

The antibody pattern study was performed using samples positive to anti-HCV from Cuban chronic and acute patients. The positivity to different HCV proteins was established using two line-dot systems (RIBA 2.0, Chiron Corp, USA and LiaTek HCV, Organon Teknika, Netherlands). Genotyping was performed by the cDNA-nested PCR procedure using specific primers for each described genotype and samples of individuals at higher risk of infection.

RESULTS AND DISCUSSION

The antibodies to core antigens appear earlier and are the most frequently found among Cuban HCV carriers (75% of acute and 100% of choronic cases) after RIBA 2.0, followed by antibodies to protein from NS3 region C33c (table 1). LiaTeck HCV showed a better performance of its core antigens (100% and 84.2% in chronic and acute cases, respectively), specially in the detection of acute cases during seroconversion (table 2). It yielded less indeterminate results in both acute and chronica individuals. The NS4 synthetic antigen in LiaTek showed a better performance (83.9%) than the recombinant proteins C-100-3 and 5-1-1 of RIBA 2.0 (58.5 and 62.3%, respectively).

The genotype II (Okamoto *et al.* 1992) was found in 26 out of 28 (92.6%) individuals tested (Table 3). This correlates with the high propensity toward chronic and more severe forms of the disease found in Cuban patients (Arús *et al*, 1994). The high rate of multiple genotypes in studied samples is due to the higher risk to HCV infection of the selected carriers, which increases the probability of multiple infection.

Table 1.
Antibody Pattern (RIBA 2.0) among Cuban patients (%)

	RIBA ANTIGENS					
PATIENTS	5-1-1	C-100-3	C33c	C22	INDET.	TOTAL
CHRONIC	29 (70.70	26 (63.4)	37 (90.2)	41 (100)	8 (19.5)	41
ACUTE	4 (33.3)	5 (41.7)	8 (66:7)	9 (75.0)	7 (58.3)	12
TOTAL	33 (62.3)	31 (58.5)	45 (84.9)	50 (94.3)	15 (28.3)	53

Table 2.
Antibody Pattern (LiaTek HCV) among Cuban patients (%)

	LiaTek ANTIGENS							
PATIENTS	NS4	NS5	C-1	C-2	C-3	C-4	INDET.	TOTAL
CHRONIC	57 (83.8)	36 (52.9)	52 (76.5)	56 (82.4)	44 (64.7)	49 (72.1)	6 (8.8)	68
ACUTE	16 (84.2)	13 (68.4)	15 (78.9)	15 (78.9)	11 (57.9)	13 (68.4)	5 (26.3)	19
TOTAL	73 (83.9)	49 (56.3)	67 (77.0)	71 (81.6)	55 (63.2)	62 (71.3)	11 (12.6)	87

Table 3
HCV Genotypes in Cuban patients*

GENOTYPE	CASES	%**
I	3	10.7
II	26	92.9
III	0	0
IV	4	14.3
V	11	39.3
VI	0	0
MULTIPLE *	16	57.1
NON CLASSIFIED	5	
TOTAL	33	

* Classification of genotypes after Okamoto *et al*, 1992
** On the basis of 28 classified cases

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THE HEPATITIS C VIRUS INFECTION IN CUBA: PREVALENCE, ANTIBODY AND RISK FACTORS

Guillermo J. Padrón[1], Enrique Arús[2], Luis Rivera[3], Ariel Viña[1], Jorge Bacallao[4].

[1]*Center for Genetic Engineering and Biotechnology,* [2]*Hospital "Hermanos Ameijeiras".* [3]*Havana Hospital "Carlos J. Finlay", and* [4]*Havana Medicine School, Havana, Cuba*

INTRODUCTION

The infection by hepatitis C virus (HCV) has been characterized based on data mainly derived from developed countries. Consequently, there is a lack of information relative to the prevalence in general population and the associated risk factors in developing countries. The present paper reports the distribution of antibodies to HCV observed in different regions and groups of the Cuban population, and the risk factors linked to this infection.

MATERIALS AND METHODS

Anti-HCV antibodies were tested in samples from 470 patients with liver diseases, 2 463 blood donors and 560 pregnant women, from 10 out of 14 Cuban provinces. Furthermore, 1 141 samples of general population were studied in Cienfuegos City. Three EIA systems were employed: BioSCREEN anti-HCV (Heber Biotec, Havana, Cuba). UBI HCV EIA (United Biomedical Inc., New York, USA) and Ortho HCV ELISA 2nd. generation (Ortho Diagnostics, Beerse, Belgium). The relative risk associated with the HCV infection was assesed by an epidemiological questionnaire.

RESULTS AND DISCUSSIONS

The overall prevalence among blood donors (0.8%) and pregnant women (1.1%) does not differ (p=0.45), in spite of a tendency of a higher prevalence in Havana than in the rest of the country (table 1). This difference is statistically significant for blood donors (1.6% vs. 0.4%, p=0.01).

Table 1
Anti-HCV prevalence in low risk groups. Cuba, 1990 - 1993

GROUP	STUDIED POPULAT.	ANTI-HCV +	PREV., %
BLOOD DONORS, CUBA	2 478	20	0.8
HAVANA*	1 744	27	1.5
OTHER PROVINCES**	1 603	6	0.37
HIGH ALAT***	170	22	12.9
PREGNANT WOMEN, CUBA	1 236	13	1.1
HAVANA****	556	7	1.3
OTHER PROVINCES**	680	6	0.8

* Includes 3 studies in 5 blood banks of Havana, 1991 - 1992.
** Study in 10 out of 14 Cuban province, September, 1992.
*** Blood Bank of Marianao, Havana, September, 1990; March, 1991.
**** All pregnant women, 8 health areas, Havana, January-May, 1992.

Table 2
Anti-HCV in general population.
Cienfuegos, May 29-July 17, 1992

SEX	AGE	SAMPLES	HCV +	PREV.*, %
MALE	15-34	133	2	1.5
	35-54	185	4	2.2
	>55	208	2	1.0
	TOTAL	526	8	1.6
FEMALE	15-34	164	3	1.8
	35-54	243	5	2.1
	>55	208	8	3.8
	TOTAL	615	16	2.3
TOTAL		1 141	24	1.9

* Non significance difference

Table 3
Anti-HCV prevalence in high risk groups. Cuba, 1990-1993

GROUP	ANTI-HCV+	PREV.%
HEMOPHILIACS *	8	44.4
HEMODIALYSIS, CUBA (1992)	137	46.7
PERITONEAL DIALYSIS, CUBA (1991)	6	9.1
HIV SEROPOSITIVES **	6	2.8
PLASMAPHERESIS BLOOD DONORS *	43	47.3
MALE HOMOSEXUALS *	3	5.3
HIGH RISK PROFESSIONALS ***	0	0.0

* City of Havana, September, 1991
**All seropositives from Havana City and Pinar del Rio province
***All risk personnel of a blood bank and an hemodialysis unit.