Changes in hepatitis C virus infection routes and genotype distribution in a Lithuanian cohort with chronic hepatitis C

Valentina Liakina

Centre of Hepatology, Gastroenterology and Dietetics
Clinic of Gastroenterology, Nephrourology and Surgery
Faculty of Medicine, Vilnius University, Lithuania

Study population

1996-2006 – 1158 chronic hepatitis C patients (638 males and 520 females; age range 16-80 years).

2014 – 116 chronic hepatitis C patients (60 males and 56 females; age range 19-77 years).

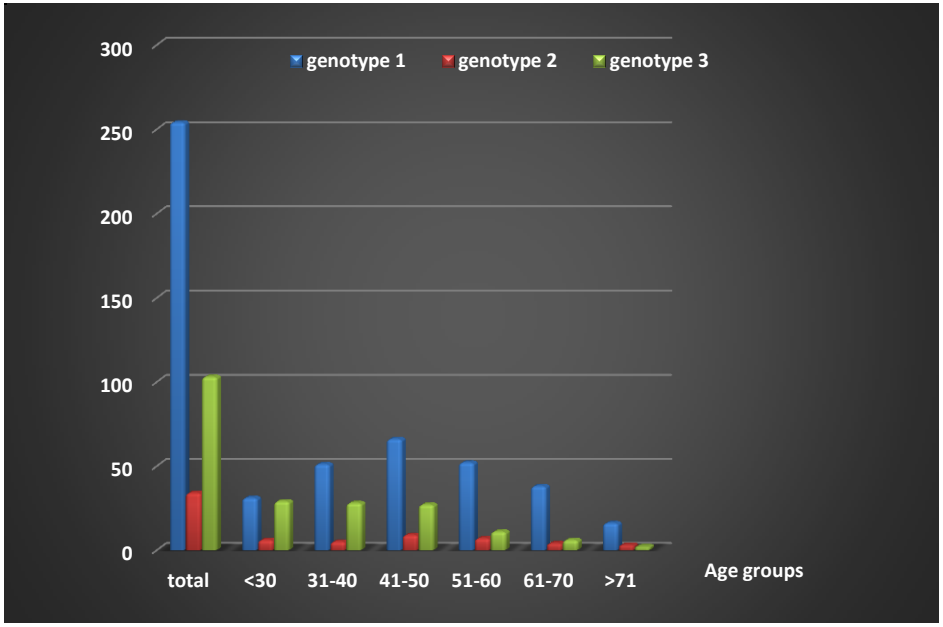
2010-2013 – anti-HCV prevalence survey **– 3737** volunteers (age range 18 -76 years) from healthy population

Anonymous questionnaire with the list of possible infection routes was proposed to the participants. The analysis of self-reported data was used for the elucidation of risks for HCV acquisition. Most of patients had indicated more than one risk factor.

The study protocol was approved by Lithuanian Ethics Committee.

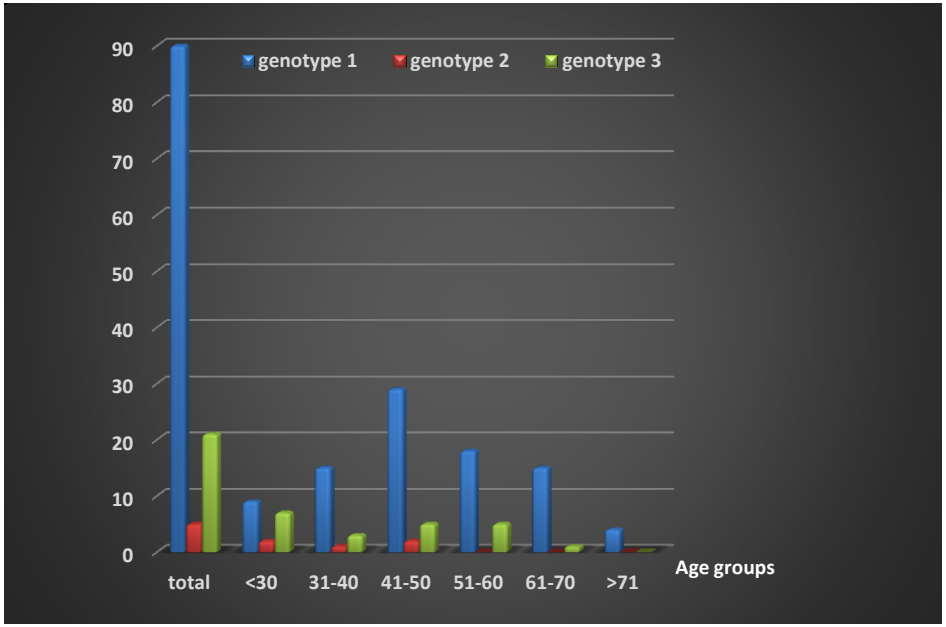
Changes in genotypes distribution in chronic hepatitis C patients

2006



Liakina V et al. Med Sci Monit 2009

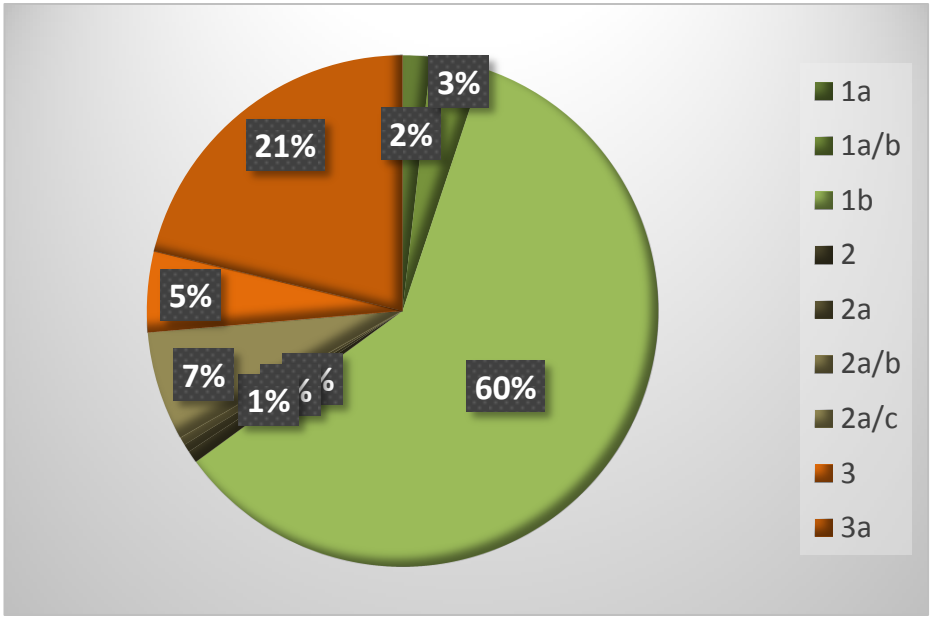
2014



Unpublished data 2014

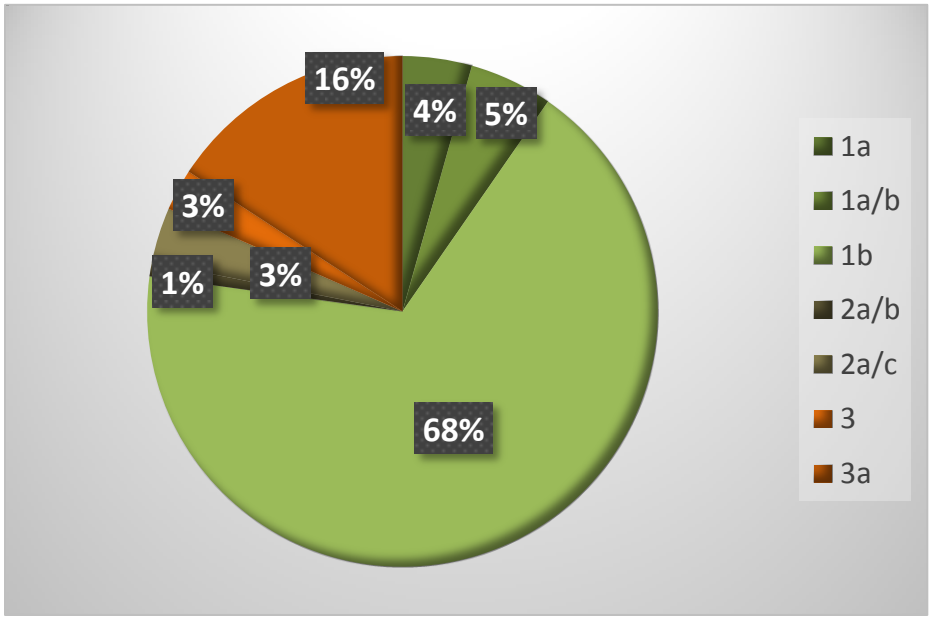
Changes in subtypes distribution in chronic hepatitis C patients

2006



Liakina V et al. Med Sci Monit 2009

2014



Unpublished data 2014

HCV genotypes in chronic hepatitis cohort

2006

- Genotype 1 – 65%
- Genotype 2 – 8.7%
- Genotype 3 – 26.3%

Liakina V et al. Med Sci Monit 2009

2014

- Genotype 1 – 77,6%
- Genotype 2 – 4,3%
- Genotype 3 – 18,1%

Liakina V et al. J Viral Hepat 2015

HCV genotypes in asymptomatic carriers

- Genotype 1 – 45%
- Genotype 2 – 20%
- Genotype 3 – 35%

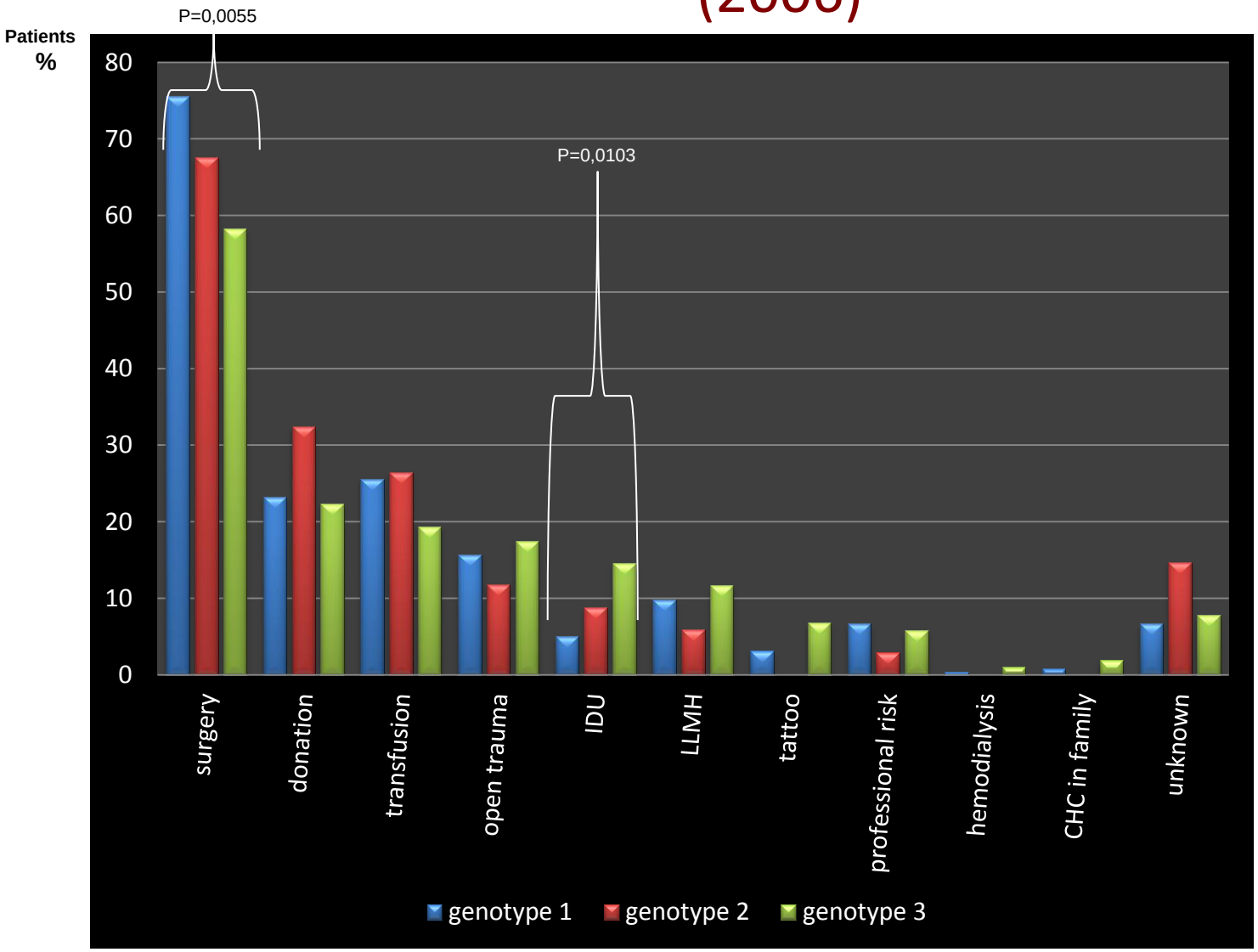
Unpublished data 2014

HCV epidemiology by country

	Lithuania	Latvia	Estonia	Poland	Germany	Norway	Sweden	Finland	Russia
Population (000)	3000	2100	1300	37100	81200	5100			
Anti-HCV prevalence, %	1,7	2,4	2,0	1,9	0,63	0,7	0,5	0,02*	1,3-5,3
Viremic prevalence, %	1,1	1,8	1,5						
Viremic rate, %	66	71	76						
Genotypes, %									
1a	2	46	1	0,6		28	24-57	18	
1b	69	4	72	85,3		28		17	50,3
1 (other)	4	13	-						
1	75	64	73	85,9	61,7	61,5	45,2	35	55,7
2	6	4	3	-	6,9	10,5	19,3	18	8,2
3	19	32	24	10,6	28	28	33,8	42	35,1
4	-	1	-	1,2	3,2		1,7	-	
other	-	-	-	2,3	0,2			5	

*WHO report 1999
Cornberg M et al. Liver International 2011
Liakina V et al. J Viral Hepat 2015

Risk factors for hepatitis C virus acquisition and genotypes (2006)



IDU – intravenous drug use; LLMH – long-lasting and multiple hospitalizations

Liakina V et al. Med Sci Monit 2009

Analysis of chronic hepatitis C patients with a single risk factor for virus acquisition (self-reported data)

Variables, %	Age / Total	<30	31-40	41-50	51-60	61-70	>71	P value
Surgery	60.4	32.4	52.0	49.5	69.2	80.7	82.7	<.0001
Donations	11.3	/2.7	16.0	27.8	11.0	2.3	1.9	<.0001
Transfusions	6.5	5.4	6.7	10.3	6.6	5.7	1.9	NS
Open trauma	3.1	4.1	6.7	2.1	2.2	2.3	1.9	NS
Tattoo	3.4	14.9	2.7	3.1	0	0	0	<.0001
IDU	5.5	29.7	2.7	2.1	0	0	0	<.0001
OE	2.3	5.4	2.7	1.0	2.2	1.1	1.9	NS
LMH	5.9	2.7	6.7	5.2	5.5	6.8	9.6	NS
Hemodialysis	1.2	0	1.3	0	4.4	1.1	0	.0733
CHC in family	0,8	2.7	2.7	0	0	0	0	NS

IDU, Intravenous drug use; OE, Occupational exposure; LMH, Long or multiple hospitalizations; CHC in family, Chronic hepatitis C in a family member.

Liakina V et al. Med Sci Monit 2009

HCV transmission routes (self-reported data)

	OR	p
• Injection drug use –	**43**	<0,0001
• HCV infection in family member –	**11**	0,0002
• Blood transfusions –	**6**	0,0002
• Delivery –	**5**	0,0224
• Tattoo –	**4**	0,0013
• Open trauma –	**4**	0,0009
• Tooth removal/prosthetics –	**3**	0,0048
• Multiple and long-lasting hospitalizations –	**3**	0,0064

Unpublished data 2014

Not confirmed as HCV transmission routes

Surgery
Blood donations
Hemodialysis
Dentistry
Abortions
Risky sexual behavior
Piercing

Unpublished data 2014

HCV transmission routes

Country	Patient setting*	No cases	Years	IDU (%)	BT (%)	Nosocomial (%)	Unknown (%)	Other (%)	Reference
France	CHC	1769	2000–2001	38	27	10	25	0	[76]
France	CHC	1145	1990–2000	45	27	0	10	16	[81]
Germany	CHC	747	2000–2001	23	12	0	54	9	[85]
Belgium	CHC	1726	1992–2002	26[a]	39[a]	9	21	5	[77]
Austria	CHC	250	1999–2000	30	22	0	45	4	[151]
Greece	CHC	1229	1987–2002	30	25	5	37	3	[78]
Sweden	CHC	312	1969–1996	53	21	0	27	9	[118]
Italy	AHC	214	1999–2004	39	0	32	13	18	[84]

[a] Over the 10-year study, blood transfusion decreased 2.7% per year and IDU increased 2.5% per year. In 2001 IDU outnumbered BT.

* CHC, Chronic hepatitis C outpatient GE/Hepatology Unit; AHC, acute hepatitis C; Nacional Surveillance System IDU, intravenous drug use; BT, blood transfusion before 1991; Nosocomial, health-care-related procedure; Other: Dialysis, haemophilia, sexual transmission, vertical transmission, tatooing, piercing.

Esteban JI et al. J of Hepatology 2008

Concluding remarks

- **1.7%** of Lithuanian population is currently anti-HCV positive. Those data are close to the data from Estonia, Poland and Latvia, but much higher than in Finland, Sweden or Norway.

- In Lithuanian population HCV **subtype 1b** prevails – 75%, genotype **3** – 19% and 6% of genotype **2**. Similar HCV genotypes distribution is observed in Estonia. In Latvia, Poland and other neighboring countries HCV genotype **4** and others also appeared.

- Nosocomial HCV transmission is well controlled in Lithuania and the main recent HCV infection route is difficult to control intravenous drug use.

- The safety of blood and blood products transfusions strongly depend on NAT sensitivity and still is a worldwide problem.