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*Viral hepatitis as hospital infection evaluated in the area  
of the Lublin Province in 1990–2001*

Nowadays hospital infections constitute an important item among infectious diseases. That is true about all hospitals the world over, even in the most developed countries. Frequency of hospital infections is estimated on the level of 5%–10% patients hospitalized. Frequency of hospital infection is mainly due to sanitary conditions in the hospital premises, hygiene regimen and aseptic procedures of the hospital staff. It has to be emphasized though that there is a close connection with the type of diagnostic and therapeutic procedures. Progress of modern medicine using more complicated-invasive procedures is bound with a higher risk of hospital infection (12). The patients who undergo highly specialist procedures, e.g. organ transplantations, bear the load of multiple overlapping factors of infection hazard. Among many pathogens responsible for hospital infection are viruses transmitted via discontinued tissues, especially primary hepatotropic ones, i.e. HBV and HCV (1, 2, 3). Broken continuity of the skin is an important route of hospital infection spread. That type of infection results from disobeyed hygiene, bad sterilization of the multiple-use ward equipment and contamination of hospital setting (5, 10, 11). The spread of infection is favored by the fact that the majority of infections produce scarce symptoms or have asymptomatic course (6). Thus unconscious carriage of the virus is very common. The infection is most often detected by chance in the period when chronic changes have developed and revealed on examinations performed for other reasons.

The group of higher risk includes especially patients on dialysis, surgical, cardiosurgical, hematological, who receive big amounts of transfused blood. Since the introduction of diagnostic tests into routine examinations and possible elimination of infected blood donors, the risk associated with blood transfusion has decreased remarkably (4).

The aim of the study was to evaluate the incidence of viral hepatitis B and C in the aspect of hospital infections viewed in the light of epidemiological situation on the area of The Lublin Province in 1990–2001.

#### MATERIAL AND METHODS

Medical records (form MZ-56) of viral hepatitis B and C filed in The Regional Sanitary-Epidemiological Station in Lublin and local sanitary-epidemiological stations as well as epidemiological histories of patients suffering from acute viral hepatitis B and C were used as the material for retrospective analyses. Totally, 1,291 cases of morbidity (611 men and 680 women) were analyzed. Since the group of medical staff was small and the data incomplete, that group was analyzed with other patients and occupational infections were not counted separately.

RESULTS

The incidence of viral hepatitis in Poland in 1990–2001 is illustrated in Fig. 1 Since 1990 a systematic decreasing tendency has been observed – totally the hepatitis B incidence rate decreased by 89.2%. Fig. 2 shows epidemiological situation in the Lublin Province in comparison to the whole territory of Poland, which seems to be similar.

The study investigated potential setting of HBV infection (Tab. 1). The number of patients infected in health care settings slowly decreased from 66.3% in 1990 to 42.5% in 2001. The percentage of infections in outpatient clinics (supposed source of HBV) decreased remarkably from 30% to 12.5%.

Table 1. Potential setting of hepatitis B virus infection

Year	No. of subjects	Setting of infection					
		hospital		outpatient clinic		total health care settings	
		N	%	N	%	N	%
1990	166	60	36.1	50	30.1	110	66.3
1991	138	48	34.8	36	26.1	84	60.7
1992	129	43	33.3	35	27.1	78	60.5
1993	160	53	33.1	48	30.0	101	63.1
1994	142	45	31.6	33	23.2	78	54.9
1995	116	37	31.8	26	22.4	63	54.3
1996	68	28	32.3	13	19.1	41	60.3
1997	52	17	32.6	10	19.2	27	51.2
1998	41	13	31.7	8	15.4	21	51.2
1999	65	20	30.8	12	18.4	32	49.2
2000	44	14	31.8	8	18.2	20	45.5
2001	40	12	30.0	5	12.5	17	42.5
	1161	390	33.6	284	24.5	672	57.9

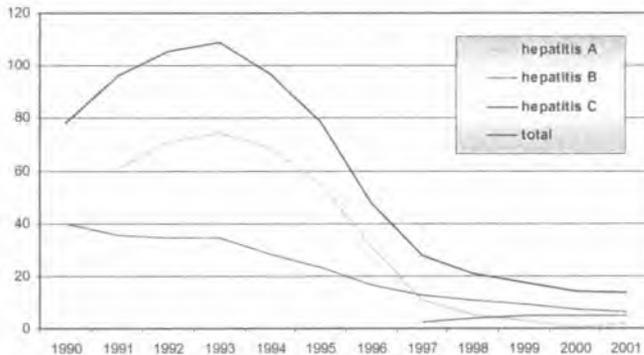


Fig. 1. Incidence of viral hepatitis in Poland in 1990–2001

The ratio of patients whose medical histories revealed injections during a hospital stay or performed in the outpatient clinics (procedures defined as “hospital injections” or “outpatient clinic injections”) tends to decrease (Fig. 3). Especially the latter decreased dramatically. The analysis found that the probable involvement of surgical procedures as a risk factor of HBV infection also decreased – about 3 times (Fig. 5). Dental procedure as the source of HBV infection (Fig. 6) has tended to decrease since 1997. However, the results suggest that despite significant decrease of HBV infections hospital infections still constitute a remarkable percentage among them (36% in 1990 and 30% in 2001 – Tab. 1).

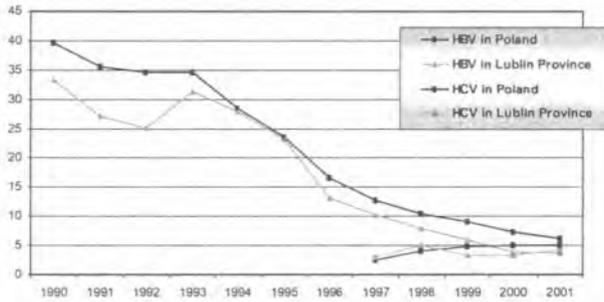


Fig. 2. Incidence of hepatitis B and hepatitis C in general population of Poland and in Lublin Province

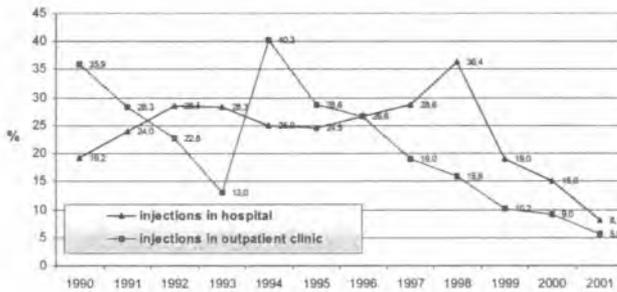


Fig. 3. Injections as potential source of hepatitis B infection

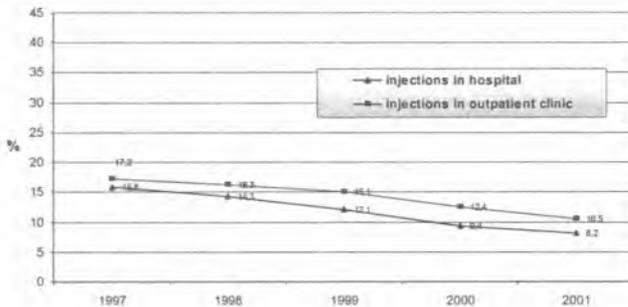


Fig. 4. Injections as potential source of hepatitis C infection

Similarly, HCV infections were analyzed, too. The percentage of patients infected in hospitals (probable source of HCV) decreased from 43.7% in 1997 to 29.2% in 2001 and the percentage of patients infected in outpatient clinics from 31% to 20.8%, respectively (Tab. 2). Fig. 3, 4 and 6 present the percentage of HCV infections caused by different medical procedures. In the period of 5 years the incidence of hepatitis C resulting from surgical procedures and from injections performed in the outpatient clinics has decreased significantly (2 times); however, the involvement of dental procedures remained on the same level (5%).

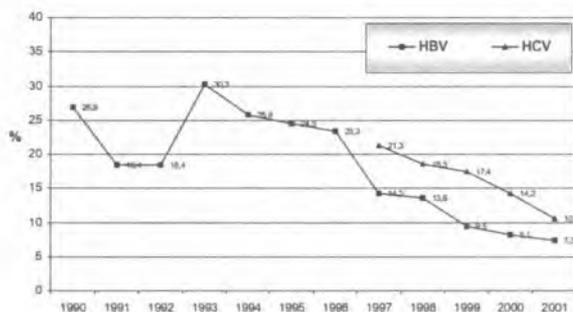


Fig. 5. Surgical procedures involved in hepatitis C infection

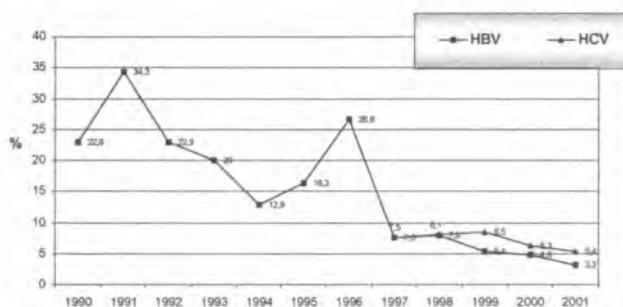


Fig. 6. Dental procedures involved in hepatitis B and hepatitis C infection

Table 2. Potential setting of hepatitis C virus infection

Year	No. of subjects	Hospital		Outpatient clinic		Total health care settings		Unknown origin %
		N	%	N	%	N	%	
1997	16	7	43.7	5	31.3	12	75.0	25.0
1998	22	9	40.9	6	27.3	15	71.2	28.8
1999	37	12	32.4	9	24.3	21	56.7	43.3
2000	39	12	30.8	9	23.1	21	53.9	46.1
2001	48	15	29.2	10	20.8	25	50.0	50.0
	162	55	33.9	39	24.1	94	58.0	42.0

## DISCUSSION

In the 1970s from 200 to 300 new cases of viral hepatitis per 100 thousand population were registered yearly. In the 80s still over 100 cases per 100 thousand population were noted. During the past decade the incidence of hepatitis B has declined dramatically. The results demonstrated clearly that epidemiological situation of viral hepatitis was influenced by health policy. That was most visible after 1993, when intense scheme to prevent and fight against viral hepatitis B was introduced. Such a good epidemiological situation undoubtedly resulted from improved efficiency of sterilization techniques and immunization program to fight viral hepatitis B introduced in 1990 (7, 8).

In 1997 new cases of viral hepatitis C were started to be registered separately. Incidence of viral hepatitis C seems to have been increasing since 1997. As the observation period is short, only 5 years, it is difficult to state explicitly whether the observed increase is real. Most probably that is the result of underregistration of a certain number of cases in the first years after the registration scheme was introduced. However, a slowly increasing trend of viral hepatitis C incidence seems distressing. The fact is also distressing that the frequency of HCV infection of unknown origin increased from 25% in 1997 to 50% in 2001. Similar results were obtained in other research centres (9). Where to look for the sources of infection, and the most important – how to fight against them? Unfortunately, there is no efficient method to prevent HCV infections. Despite much research effort all over the world still there is no most effective weapon, i.e. specific vaccine.

## CONCLUSIONS

1. The incidence of hepatitis B has decreased significantly as a result of HBV control program, while an increasing trend of viral hepatitis C incidence seems distressing.
2. Despite improved epidemiological situation the ratio of hospital infections remains high.
3. We have to be aware that epidemiological situation of infectious diseases, especially viral hepatitis B and C which is unstable, can worsen. It has to be emphasized that the results of current policy will produce effects in a couple of years. Therefore, continuous monitoring, thorough analysis of incoming data and pertinent management are so important.

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### SUMMARY

Viral hepatitis type B and C poses a very serious health problem, epidemiological, even economic. A marked number of HBV and HCV infections are hospital infections. The aim of the study was to evaluate the incidence of viral hepatitis B and C in the aspect of hospital infections viewed in the light of epidemiological situation on the area of The Lublin Province in 1990–2001. Retrospective analysis included data from The Regional Sanitary–Epidemiological Station in Lublin and local stations as well as epidemiological histories of the patients suffering from viral hepatitis B and C. In addition to that, the study evaluated epidemiological situation, causes and frequency and the presence of risk of hospital infection. The analysis found that in 1990–2001 the incidence of viral hepatitis B decreased significantly. Vaccination much contributed to better epidemiological situation as far as viral hepatitis B is concerned; however, the percentage of hospital infections remains significant. Since 1997 the incidence and morbidity of viral hepatitis C has been increasing slowly and systematically. At present, increased nonspecific preventive measures are most important.

Wirusowe zapalenie wątroby jako zakażenie szpitalne na terenie województwa lubelskiego w latach 1990–2001

Wirusowe zapalenia wątroby typu B i C stanowią bardzo poważny problem zdrowotny, epidemiologiczny, a nawet ekonomiczny. Znaczna część zakażeń HBV i HCV to zakażenia szpitalne. Celem pracy była ocena zapadalności na wzv B i C w aspekcie zakażeń szpitalnych na tle sytuacji epidemiologicznej w woj. lubelskim w latach 1990–2001. Przeprowadzono badania retrospektywne, analizując dane WSSE w Lublinie i stacji powiatowych oraz wywiady epidemiologiczne chorych na wzv B i C. Dokonano oceny sytuacji epidemiologicznej, przyczyn zachorowań na wzv B i C, ich częstości oraz obecności czynnika ryzyka zakażenia szpitalnego. Analiza wykazała, że w latach 1990–2001 nastąpił znaczący spadek zapadalności na wzv typu B. Szczepienia ochronne w znacznym stopniu przyczyniły się do poprawy sytuacji epidemiologicznej w zakresie wzv B, jednak procentowy udział zakażeń szpitalnych jest nadal znaczący. Począwszy od 1997 roku, obserwuje się powolny, systematyczny wzrost zapadalności i liczby zachorowań na wzv C. W obecnej sytuacji epidemiologicznej wzv B i wzv C najbardziej istotne jest nasilenie nieswoistego działania zapobiegawczego.