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Prevalence of hepatitis C among injectors in Scotland 1989–2000: declining trends among young injectors halt in the late 1990s

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SUMMARY

We previously reported a continual decline in anti-HCV prevalence among young injectors from Glasgow and Lothian between 1990 and 1997. The original study was extended to ascertain if the anti-HCV prevalence among injectors from Glasgow, Lothian, Tayside and Grampian had changed since 1997. Residual sera from injectors who had undergone attributable anti-HIV testing were tested anonymously for anti-HCV. In all four regions, no significant changes in prevalence were found among those aged < 25 years during the late 1990s (Glasgow 1997–9/00: 43%–41%; Lothian 1997–9: 13%–17%; Tayside 1997–9: 45%–35%; Grampian 1996–9: 28%–29%). Among those aged $\geqslant 25$ years, significant decreases in prevalence were only observed in Glasgow (1997–9/00: 79%–72%, $P = 0{\cdot}03$) and Lothian (1997–9: 54%–45%, $P = 0{\cdot}05$). The findings highlight that existing harm reduction measures, acknowledged as having helped to reduce the spread of HCV, are not sufficient to bring this epidemic under control and reduce transmission to sporadic levels.

INTRODUCTION

In the late 1980s and 1990s, the United Kingdom implemented and continued to develop interventions, including the provision of sterile injecting equipment, to reduce needle/syringe sharing and thus the transmission of blood-borne viruses among injectors [1, 2]. To determine if the prevalence of hepatitis C virus antibodies (anti-HCV) among injectors in Scotland had changed in this era of harm reduction, residual sera from injectors who had undergone named anti-HIV testing during 1990–7 were tested for anti-HCV. This showed significant reductions in anti-HCV prevalence among injectors aged under 25 years from Glasgow and Lothian between 1990 (Glasgow 91%; Lothian 69%) and 1995 (59%; 31%) and 1997 (43%; 13%), suggesting that there had been a steady, continual, decrease in the incidence of HCV among this group [3]. A different pattern emerged for injectors aged under 25 years from Tayside [4], where anti-HCV prevalence fell, but not significantly, between 1993 (57%) and 1995/6 (42%) and then increased slightly in 1997 (46%).

Despite increased provision of sterile injecting equipment throughout the 1990s, surveys, conducted among community-wide samples of injectors in Glasgow, showed a rise in needle/syringe sharing in 1999 [5]; 45% of injectors, who had commenced injecting in the previous 2 years, reporting sharing

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Table 1*a*. *Hepatitis C antibody prevalence among injectors in Scotland: unlinked anonymous testing of specimens taken for named HIV testing.*

Region	Age (years)	Year of specimen											
		1990		1993		1995		1996		1997		1999	
		+ve/N	% (95% CI)	+ve/N	% (95% CI)	+ve/N	% (95% CI)	+ve/N	% (95% CI)	+ve/N	% (95% CI)	+ve/N	% (95% CI)
												*1999/2000	
Glasgow*	< 25	140/154	91 (85–95)	–	–	64/108	59 (49–68)	59/97	61 (50–70)	58/136	43 (34–51)	74/181	41 (34–48)
	⩾ 25	124/141	88 (81–93)	–	–	221/262	84 (79–88)	190/215	88 (83–92)	259/327	79 (74–83)	281/391	72 (67–76)
	All	264/295	89 (85–93)	–	–	285/370	77 (72–81)	249/312	80 (75–84)	317/463	68 (64–73)	379/611	62 (58–66)
Grampian	< 25	–	–	–	–	–	–	33/120	28 (20–37)	–	–	66/225	29 (24–36)
	⩾ 25	–	–	–	–	–	–	49/100	49 (39–59)	–	–	98/209	47 (40–54)
	All	–	–	–	–	–	–	84/223	38 (31–44)	–	–	165/438	38 (33–42)
		*1989/90											
Lothian*	< 25	289/416	69 (65–74)	–	–	33/106	31 (23–41)	19/114	17 (11–25)	15/112	13 (8–21)	22/128	17 (11–25)
	⩾ 25	467/585	80 (76–83)	–	–	144/200	72 (65–78)	115/193	60 (52–67)	116/213	54 (48–61)	120/266	45 (39–51)
	All	756/1001	76 (73–78)	–	–	177/306	58 (52–63)	134/307	44 (38–49)	131/327	40 (35–46)	142/394	36 (31–41)
								*1995/96					
Tayside*	<25	–	–	27/47	57 (42–71)	–	–	47/113	42 (33–51)	15/33	45 (29–63)	18/51	35 (23–50)
	⩾ 25	–	–	65/85	76 (66–85)	–	–	199/273	73 (67–78)	89/127	70 (61–78)	66/109	61 (51–70)
	All	–	–	94/134	70 (62–78)	–	–	251/395	64 (59–68)	106/162	65 (58–73)	84/160	53 (44–60)

– Samples not available for testing.

* For injectors in Glasgow 1999/2000, Lothian 1989/90, and Tayside 1995/6, it was not possible to separate the anti-HCV results of specimens into the appropriate calendar years.

Table 1*b*. *Statistical test for change in prevalence of hepatitis C antibody*.

	Glasgow† (1997–9/2000)	Grampian (1996–9)	Lothian† (1997–9)	Tayside (1993–9)	Tayside (1997–9)
< 25 years	$\chi^2 = 0{\cdot}04$; NS	$\chi^2 = 0{\cdot}05$; NS	$\chi^2 = 0{\cdot}4$; NS	χ^2 trend = 3·9; $P = 0{\cdot}05$	$\chi^2 = 0{\cdot}5$; NS
⩾ 25 years	$\chi^2 = 4{\cdot}8$; $P = 0{\cdot}03$	$\chi^2 = 0{\cdot}05$; NS	$\chi^2 = 3{\cdot}8$; $P = 0{\cdot}05$	χ^2 trend = 6·6; $P = 0{\cdot}01$	$\chi^2 = 2{\cdot}0$; NS

NS, Non-significant change at the 5% level.
† Previous year comparisons have been reported elsewhere [3].

(previous 6 months) in 1999 compared to 33% in 1991–4. Similarly, surveillance data from Scotland's Drug Misuse Database have revealed higher rates of sharing in 1999–2000 compared to previous years [6]. It is therefore vital that any trends in blood-borne virus transmission among injectors are closely monitored. The original study was extended to ascertain if the trends in anti-HCV prevalence, detected among injectors from Glasgow, Lothian and Tayside up until 1997, had continued in 1999–2000, and if there had been any trend in anti-HCV prevalence among injectors from Grampian, a region which has experienced an epidemic of acute hepatitis B infection associated with injecting drug use since 1997 [7].

METHODS

The Scottish Centre for Infection and Environmental Health (SCIEH) holds anonymized epidemiological data (including soundex code of surname, date of birth, gender, laboratory number of the test, date of specimen and risk category (e.g. injecting drug user)) on all persons who have had a named HIV antibody test in Scotland since 1989 [8]. Records which belonged to individuals who had indicated that they had injected drugs and whose blood specimens had undergone named HIV antibody testing at the main virology laboratories in Greater Glasgow (during 1999–2000), Lothian (1999), Grampian (1996, 1999) and Tayside (1999) were identified.

A list of laboratory numbers, each corresponding to an eligible record, was aligned with an adhesive label which bore a code, indicating the patient's 5 year age band and gender. Lists of laboratory numbers and codes were then sent from SCIEH to the respective four laboratories: Regional Virus Laboratory, Gartnavel Hospital, Glasgow; Regional Clinical Virology Laboratory, City Hospital, Edinburgh; Department of Medical Microbiology, Royal Infirmary, Aberdeen; Department of Medical Microbiology, Ninewells Hospital, Dundee. These laboratories serve the injecting drug using populations of the above cities and their surrounding areas. Residual sera from injectors, which had been stored following their HIV antibody tests, were identified from serum archives using laboratory numbers. Sera were pipetted into vials onto which the corresponding coded labels, but not laboratory numbers, were attached to avoid any possibility of a person's identity being deduced. The survey approach had previously been granted ethical committee approval [9].

The sera were tested for anti-HCV using an ELISA assay (3rd generations Ortho, Chiron, or Abbott, Axsym). Samples found reactive were retested by either a recombinant immunoblot assay (3rd generation RIBA, Chiron) or Monolisa (Sanofi Pasteur). Once completed, results were sent to SCIEH and analysed by gender, age band, area and year of specimen. Table 1*a* shows the prevalences of anti-HCV for the years where testing was carried out. Statistical analyses, shown in Table 1*b*, were restricted to age and region comparisons and, in particular, comparisons between years 1996/7 and 1999/2000 (previous year comparisons for Glasgow, Lothian and Tayside have been reported elsewhere [3, 4]). Prevalence rates did not differ greatly between males and females and are not presented.

RESULTS

In all four regions, no significant changes in prevalence were found among those aged < 25 years during the late 1990s (Glasgow 1997–9/00: 43%–41%; Grampian 1996–9: 28%–29%; Lothian 1997–9: 13%–17%; Tayside 1997–9: 45%–35%). Among those aged ⩾ 25 years, significant decreases in prevalence were observed during the late 1990s in Glasgow (1997–9/00: 79%–72%) and Lothian (1997–9: 54%–45%), but not in Grampian (1996–9:

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49%–47%) or Tayside (1997–9: 70%–61%). Significant declining trends in prevalence among injectors in Tayside, which were not detected by 1997, were now evident between 1993 and 1999, among both those aged < 25 years (57% to 35%; $P = 0{\cdot}05$) and $\geqslant 25$ years (76% to 61%; $P = 0{\cdot}01$).

DISCUSSION

It is difficult to judge whether the anti-HCV prevalence of injectors studied (those presenting for HIV testing) represents that of the total injecting population. Surveys conducted between 1990–9 among community-wide samples of current injectors in Glasgow [10] showed that those who had even been tested for HIV had a consistently higher salivary anti-HCV prevalence, on average 1·2 times higher, than those who had never been tested for HIV (SCIEH: unpublished data). This suggests that the study group was more at risk of HCV infection than the total population. Whilst the authors recognize that the rates observed may not entirely reflect those of the respective injecting populations, it is possible to examine relative changes in anti-HCV prevalence year by year. The HIV prevalence among injectors undergoing HIV testing remained low and stable ($< 5\%$) during the period of investigation [11], and was ruled out as a factor of influence on the observed trends in anti-HCV. Participation bias was not an issue through the use of the unlinked anonymous testing method.

The sizeable reductions in anti-HCV prevalence among young, newly initiated, injectors from Glasgow and Lothian from the early to mid 1990s [3] lent support to the hypothesis that harm reduction interventions, including needle exchanges, had played a causal role in reducing the spread of the virus. The absence of even small reductions in anti-HCV prevalence among young injectors in Glasgow and Lothian between 1997 and 1999/2000 heightens our concerns that existing measures, acknowledged as having helped to reduce the spread of HCV [3, 9, 10], are not sufficient to bring this epidemic under control and reduce transmission to sporadic levels, as has been achieved for HIV infection in Scotland. Similar difficulties in controlling the spread of HCV among injectors have been observed in other countries where comprehensive harm reduction programmes exist [12, 13].

Data on Tayside and Grampian injectors for the early 1990s period are unavailable. However, the gradual declining trend in anti-HCV prevalence of Tayside injectors since 1993, reaching significance in 1999, does suggest that interventions are reducing, albeit slowly, the risk of infection with HCV. The absence of a decline in HCV antibodies among injectors from Grampian between 1996 and 1999 is a particular cause for concern. The rise in acute infection with hepatitis B in 1997–8 in Grampian [7] was the first warning that blood-borne virus infection was spreading appreciably through this injecting population. Surveillance data on attributable HIV tests [11] do not indicate any appreciable spread of HIV among injectors in Grampian. Nevertheless, urgent action is needed to tackle the factors causing the frequent transmission of HCV and HBV before there is also an upsurge of HIV.

The anti-HCV prevalence rates among injectors in Scotland, particularly in Glasgow and Tayside, are higher than those observed in England and Wales, where studies of injectors recruited in prison [14] and in community/agency [15] settings in 1997–8, detected overall anti-HCV prevalences of 30%. The reason for this geographical variation in anti-HCV prevalence requires investigation, but it would be unwise not to draw inferences from the association with needle/-syringe distribution. A recent survey [16], involving needle/syringe exchange coordinators throughout the UK, estimated that the rate of needle/syringe distribution in Scotland was 3–4 fold lower than in England and Wales in 1997. This finding is consistent with current regulations imposed on exchanges in Scotland [17], but not in England and Wales, which restrict injectors to a maximum of 15 needles/syringes per visit. It is possible that the inequity in needle/syringe distribution between Scotland and England/Wales may have contributed to their different rates of anti-HCV. In Glasgow, poor access to sterile equipment is correlated with an increased frequency of needle/syringe sharing [18]. Accordingly, research is required to evaluate the effect on the spread of HCV of improving injectors access to sterile injecting equipment, by, for example, removing restrictions on the numbers of needles/syringes distributed. Needle/syringe exchanges were established in a climate of considerable public opposition and have since been deemed a public health success for preventing HIV infection and are accepted as part of the mainstream community health service [19]. If, as is likely, there is a direct relationship between needle/syringe inaccessibility and HCV transmission in the UK and elsewhere, the public health challenge is self evident.

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