

Heterosexual clusters of HIV infection

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There are a small number of heterosexuals believed to have acquired their HIV infection within the UK, having neither a partner with a recognised risk factor or a partner from an area of the world with high HIV prevalence¹. Occasionally a cluster of heterosexually acquired HIV infection, as documented on page 271-5² with the Doncaster outbreak, is detected amongst these cases. We define a cluster as two or more cases linked to one source during a specific time period, as opposed to a chain of linked infections over time³. The much larger numbers of homosexual men acquiring HIV in the UK¹ would indicate many clusters like this one must be occurring among them too, but due to the numbers and the frequency of casual or anonymous partners, these clusters would be difficult to detect. Also in large cities with several or more HIV outpatient centres and clinics, the likelihood, of detecting a cluster, whether of homosexual or heterosexual transmissions, is considerably reduced.

Surveillance information categorises HIV infected individuals on the basis of how they probably acquired their infection¹. When reports are received at the PHLS HIV and Sexually Transmitted Infections (STI) Division at CDSC, they are, whenever possible, assigned to a probable exposure category on the basis of the information provided. Reports which provide insufficient

information to justify allocation to an exposure category are followed up, as are all reports suggesting that infection was acquired heterosexually within the UK without exposure to partners at high risk of infection or to partners from countries where heterosexual transmission is common³. The classification for those cases believed to have been infected heterosexually is more detailed than for the other exposure groups as

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information is sought not only about the cases but also about their partners and the area of the world where infection may have taken place¹.

The primary purpose for this detailed follow up is to have accurate surveillance information on trends in HIV infections acquired heterosexually within the UK^{4,5}. The secondary purpose is to establish the route of infection for cases reported without an identified risk and, in so doing, to detect promptly any unusual routes of transmission should they occur⁶. In some instances

this also enables heterosexual clusters to be identified.

For the majority of cases reported that require further classification the exposure category is clarified by a telephone call from the nurse-counsellor from the HIV and STI Division at CDSC to the clinician, health adviser or other clinic personnel. It is from these conversations about the transmission route that information about a possible HIV cluster is often obtained. If the route of infection remains unknown or the information suggests that infection was acquired heterosexually within the UK in the absence of a partner with a risk factor or partners from high prevalence countries, then a request is made from the nurse-counsellor through the clinician for an interview with the patient. If the patient consents, a confidential face-to-face interview is conducted³. Links with other HIV infected individuals can sometimes be identified from these interviews through patients providing information about partners and ex-partners, which gives another opportunity to recognise a possible HIV heterosexual cluster. For a cluster, the primary case is the case believed to be the source of the infection, and the index case is the individual first diagnosed with the infection. The primary and index cases can therefore be different individuals and this is what occurred in the Doncaster cluster, presented in this issue, where the index case was female and the primary case was male.

The identification of an HIV cluster is nevertheless difficult and is usually dependent on the staff from sexual health clinics or other HIV outpatient centres obtaining partner details from patients and then linking them with others, either from the same source, or further along the same sexual network chain. This assumes that newly diagnosed individuals will know the identity of their sexual partners and be prepared to share sensitive details of their partners (past and present) with clinic or hospital staff. The Doncaster cluster^{7,8} was only

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identified because the clinic staff became aware of five women who had named the same man as the most likely cause of their HIV infection.

For the majority of HIV outpatient centres and clinics, the ability to identify a cluster such as the Doncaster one remains small, though the likelihood of this happening increases in parts of the country where there are relatively few HIV infected individuals. From discussions with sexual health colleagues around the country, the HIV and STI Division at CDSC are aware of a small number of other clusters of from three to eight cases; however we believe this to be an underestimate reflecting the difficulty of recognising clusters. For most of the centres where small clusters of linked infections have been identified, case finding has been carried out through partner notification practices involving the co-operation of the index case.

Published reports of HIV clusters remain rare, with only three other heterosexual clusters in the world scientific literature^{9,10,11}. The first was a cluster in Belgium⁹, which was reported in 1989, where, of 18 female contacts who agreed to be tested for HIV, 11 were found to be HIV positive. The second cluster¹⁰ was reported in 1999 from a rural county in upstate New York where, of 42 female contacts tested for HIV infection, 13 were found to be HIV positive. Investigation of the male partners of the 13 positive female partners identified one further infected individual from the 50 tested. The third cluster¹¹, reported in 2000 from Mississippi, emerged from an investigation of a social network of 122 individuals. Within a larger social network there was a sexual network of 44 young people, seven of whom were HIV infected. In this instance the primary case was not identified.

Characteristics that may be important in determining the likelihood of HIV transmission within clusters include the high viral load of the primary case, either due to early HIV infection or from advanced HIV disease, and ulceration associated with other

sexually transmitted infections. Age differences were found to have implications for HIV transmission in Mississippi, with the adolescent females who had acquired infection having had older male partners¹¹. Older male partners contribute substantially to sexually transmitted infections and pregnancy in teenagers¹². Age disparity is a situation that undermines young women's ability to negotiate safer sex and condom use.

The Doncaster investigation represented a rather different situation to other clusters in that the primary case, working in the entertainment industry, reported he had had a large number of casual sexual contacts whom he was unable to identify. It was because of his inability to inform the women he may have put at risk from HIV that the decision to convene an 'outbreak' team was instigated.

The 'outbreak' (i.e. incident team) set up in Doncaster enabled a wide range of professionals to contribute and share their expertise. These included those from sexual health, health policy and public health, communicable disease control and epidemiology, legal advisors and public relations personnel. Such a team has more chance of success if, as was the case in Doncaster, a good working relationship exists between the communicable disease control consultants and the sexual health clinic staff. Practical issues had to be agreed such as health promotion response, setting up a telephone helpline and dealing with the increase in patients attending an already oversubscribed service with consequences of requiring more staff, longer clinic hours and additional support.

Because of the Venereal Diseases Regulations and Acts (1916, 1946, 1974 and 1991)¹³, sexual health clinic staff are bound by strict confidentiality guidelines with regard to revealing the identity of their patients. In the case of Doncaster, staff were most vigilant about maintaining the anonymity of the index patient. This extended to the offer of alternative accommodation for him when the

incident was released to the press. The possibility of his partners identifying him could not be ruled out, however, and in the end he himself disclosed his identity to the press.

There is a duty of care to warn others, as well as a duty of care to maintain confidentiality of an HIV infected patient, if the HIV infected case is believed to be continuing to place his or her sexual partners at risk of acquiring HIV infection. There have been four test cases in Europe; two in Cyprus^{14,15}, one in Finland¹⁶ and one in Scotland¹⁷, where the HIV infected individuals have been given prison sentences because they knowingly continued to have unprotected sexual contact with their partners without disclosing their HIV status. With the Doncaster case, transmissions were identified as occurring before the primary case had been diagnosed. In the UK (in contrast to the many more cases in the US) the courts have been little used in this complex area of human relationships.

In establishing transmission clusters, it is necessary for blood samples for HIV sequencing and typing to be taken from the individuals suspected of being linked to the same common source of infection⁸. It was this genome sequencing that was used as evidence of one individual infecting another that led to a conviction in the recent Scottish trial referred to above. Understandably, there is concern that in future investigations, individuals may refuse to provide blood samples for sequencing and typing because of possible later legal repercussions. This could undermine this type of specialist work, and the ability to confirm clusters should they be recognised.

The public health response to the local outbreak of heterosexually acquired HIV infection in Doncaster has demonstrated how the different medical disciplines, other NHS professional groups and those outside the NHS can work together effectively in a very sensitive area. Why the UK Media made much of this cluster is not known. More recently a similar cluster in another

northern town evoked no national media response and only limited local press interest¹⁸.

The question needs to be asked whether the disruption to other public health work and the opportunity and real costs of the Doncaster investigation were justified. The initial infection rate seemed very high as five of the eleven patients tested were found to be HIV positive. It was uncertain how much further spread might have occurred and in the absence of any other method of identifying the large number of anonymous and casual sexual contacts, a public response of this nature was needed to encourage people who might have been at risk to be tested. The local handling of the case was exemplary, and this experience will be important in dealing with clusters in the future especially where more widespread transmission is thought to have occurred. Lessons learnt have been incorporated into guidance for handling clusters/outbreaks of HIV or other STIs now on the PHLS website¹⁹.

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