Ethics of transmission of hepatitis B virus by health-care workers

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Health-care workers have transmitted hepatitis B virus (HBV) to patients in clinical settings,
most frequently during surgery or exposure-prone procedures. The term “health-care worker” usually includes all people who touch patients or items connected to the patients’ bodies; however, our use of the term refers to only those whose blood or body fluids come into contact with patients in such a way that HBV could be transmitted to a patient. In 1991, the Centers for Disease Control and Prevention (CDC) estimated that during the past 20 years more than 300 patients had been infected with HBV “in association with treatment” by infected health-care workers. Subsequent reports mention “approximately 400 cases” of “provider-to-patient” transmission of this infection. Nevertheless, the CDC study explicitly failed to advocate mandatory testing for HBV or any general restriction on performance of exposure-prone procedures. Instead, the CDC recommended that health-care workers infected with HBV should be dealt with on a case-by-case basis, each case separately assessed so that appropriate counselling and follow-up could be tailored to the individual. Health-care workers were advised to know their hepatitis B status—non-immune, immune, or infected. If they had HBV, testing was recommended to show the presence of e-antigen, which was considered to indicate the degree of infectivity. If they were e-antigen positive, health-care workers were to be assessed and counselled by an expert review panel about restrictions they should or might be obliged to observe in clinical practice.

What is striking here is the CDC’s emphasis on the rights of health-care workers and the scant attention paid to the risk of transmission of a serious and potentially fatal disease to patients: “Panels must recognise the importance of confidentiality and the privacy rights of infected health-care workers.” In 1975, Alter and colleagues found “no association with treatment” by infected health-care workers. In 1997, the Society for Healthcare Epidemiology in America (SHEA) published its recommendations for the management of health-care workers infected with HBV, which coincide with the previously cited recommendations and specifically oppose “routine mandatory testing” of health providers.

Despite accumulating evidence that transmission of HBV from health-care workers to patients may be a greater risk than estimated in 1991, policies to inform and protect patients have hardly evolved in the intervening years. In a brief personal and telephone survey of five large medical centres in the New York City metropolitan area, we found that the recommendations of the 1991 CDC publication are still generally observed. Institutions have their own ad-hoc policies, usually in accordance with the recommendations in the 1991 CDC publication. Only one hospital reported checking e-antigen negative HBV-infected health-care workers for hepatitis B viral DNA in serum samples, the “best indication of active viral replication”, as a basis for assessing infectivity. Moreover, few hospitals restrict the clinical privileges of those infected with HBV but without evidence of the e-antigen. Certain e-antigen negative HBV-infected individuals are just as infectious as e-antigen positive ones. Even worse: “hepatitis B e-antigen negative mutants have been associated with fulminant hepatitis B and have caused more severe chronic hepatitis” than in most other cases of hepatitis B.

Opinions differ about whether patients are sufficiently protected by policies currently in place that allow health-care workers infected with HBV to perform exposure-prone and invasive procedures on patients. Most discussions make no mention of informed consent, the doctrine that “imposes a legal duty upon the physician to provide a patient with sufficient information about the potential side-effects of a recommended treatment, in order to allow the patient to make...
an informed and intelligent choice to either accept or reject treatment or diagnosis.” (http:www. afip.mil/homes/legalmed.html site accessed on Aug 14, 1998). Many health-care professionals believe that informed consent to medical treatment is a legal concept that they are free to ignore as a “waste of time and energy” or, more benignly, that “their integrity, training, professional dedication to patients’ best medical interests, and commitment to ‘doing no harm’ are sufficient safeguards for patients.” Nevertheless, patients have a right to know what benefits and risks are associated with any procedure, and to make decisions based on their willingness to accept or reject them.

The question, of course, is: should health-care workers infected with HBV be restricted in their contact with patients? This issue has evidently been felt to be so delicate that it seems to have been largely avoided. Formulation of protective policies for patients are only at the planning stage in most institutions, because of conflicting considerations. Health-care workers may also have been reluctant to inform patients fully about an important risk out of fear that their right to exercise skills in which they have become expert will be unreasonably curtailed. This attribute is troubling, since it pits the job security of physicians and certain other health-care workers against potentially life-threatening complications for patients. How can employment prospects of medical professionals be equated in importance with a risk of acquiring hepatitis B? Moreover, in our litigious society, how has it happened that the doctrine of informed consent is still neglected in this context? The fact that the transmission of HBV to patients by health-care workers is rare does not alter the incommensurate nature of the opposing considerations. Also, since it is now well known that HBV is more readily transmitted from one person to another than HIV-1 or the hepatitis C virus, one should not compare the risk of acquiring HBV with that of these similarly transmitted viral infections.

Reliable risk estimates for transmission from a health-care worker infected with HBV to patients in different settings cannot be calculated because of variations in both viruses and practices, and, most importantly, to the circumstance that there are really no good figures on hand for risk. Thus, we are obliged to use rough estimates. However, there is enough information about the degree of risk to give us a good idea of the risk of transmission. Probably about 1% of surgeons are infected with HBV, and transmission is “thought to be uncommon”. If there is a 10% chance for a surgeon who is infected with HBV to transmit the virus to a patient, the risk is about 1 per 1000 people, which may be judged a moderate degree of risk. However, the degree of risk to patients from HBV-infected health-care workers cannot be readily quantified, because we have only a rough idea how many workers are infected or how many of them perform exposure-prone procedures. Beekman and Doebbeling use a different approach from one that uses such terms as “uncommon” or “about 1%”, namely as 57% to 100% in at least one patient per 3500 procedures performed by a surgeon seropositive for the HBV e-antigen. Transmission is known to have occurred in minor invasive procedures, although understandably less frequently than during more extensive surgical procedures.

Risks are, of course, kept to a minimum by universal immunisation of health-care workers, and this may come to pass as successive graduates of medical school and residency (postgraduate) programmes are immunised. Naturally, there are difficulties: some health-care workers choose not to be immunised, and immunity may perhaps not be achieved by everyone who receives the vaccine series. An informal survey of colleagues in the New York City metropolitan area revealed a consensus that about 85–95% of health-care workers are accepting the hepatitis B vaccination series. However, HBV variants exist for which current vaccines are ineffective, and these mutant forms may even be becoming more prevalent.

Some have held that the risk to patients from health-care workers infected with HBV is justifiable, because barring such a worker from practising his or her professional specialty is a more serious consequence than the small chance that a patient will become infected by that worker. That stance is common in many of the references cited above. On the other hand, HBV infection can be serious or fatal and may also spread to others. Fulminant hepatitis requiring liver transplantation for survival has resulted from one brief contact with a body fluid of an infected person.

The risk of transmission may be acceptable to one person, but not to another. If patients are to make a decision about acceptance of a risk associated with a certain procedure, they must be informed about it in advance. That principle underlies informed consent. Similarly, a surgeon with HBV may decide not to accept the risk of transmitting the infection to a patient and decide not to perform exposure-prone procedures.

The risk of transmitting HBV to patients by health-care workers is almost entirely avoidable. It should be possible to require all medical and nursing students, and all health-care workers in training programmes to be immunised, unless there is a medical reason not to do so. Infants in the USA are now being immunised at birth. Furthermore, nearly all infected health-care workers can be identified and prevented from carrying out exposure-prone services.

We compared three possible strategies for dealing with HBV-infected health-care workers (panel). The two categories of “justified” and “acceptable” in Calman’s article are combined, from two perspectives: the presumed best interests of patients, with due respect to informed consent, and the imagined perspective of the infected worker. Strategy 1, to our knowledge, is not currently observed anywhere, although strategies 2 and 3, or variants of them, are common policies.

The issue of HBV infection among health-care workers remains a challenge for the health-care system. Policies on health-care workers’ contact with patients must take ethical and social factors into account. Patients should never be denied the opportunity to participate fully in decision-making about their own care, and the health-care system must at the same time safeguard the professional prospects of health-care providers infected with HBV.

References
3 Halle M. Patients want ban on operations by doctors with hepatitis B. BMJ 1996; 313: 576.
Three strategies to deal with health-care workers infected with HBV

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Is the risk to patients avoided?</th>
<th>Justifiable and acceptable risk for patients?</th>
<th>Justifiable and acceptable risk for HCWs?</th>
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<tbody>
<tr>
<td>1 Protection of patients is paramount</td>
<td>Yes, as completely as possible</td>
<td>Yes</td>
<td>No</td>
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<td>All HBV-infected prohibited from performing exposure-prone procedures. Uninfected HCWs, with rare exceptions, are required to be immunised.</td>
<td>Nearly 100% of patients protected from transmission of HBV from HCWs, since essentially no exposure of patients to HBV-infected HCWs occurs.</td>
<td>Risk to patients of HBV infection from HCWs is as close to zero as can be achieved.</td>
<td>欧阳Extreme measure unfairly restricts careers of skilled, highly trained HCWs.</td>
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<td>2 Patients are protected, HCWs’ rights are respected</td>
<td>Yes, to a great extent</td>
<td>No</td>
<td>Yes</td>
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<td>HBV-infected HCWs are identified and counselled, excluding those who are e-antigen positive or have transmitted HBV to patients in exposure-prone procedures. Uninfected HCWs, with rare exceptions, are required to be immunised.</td>
<td>Most patients protected from transmission of HBV by HCWs, but some patients may become infected from contacts with HBV-infected HCWs.</td>
<td>HBV-infected, e-antigen negative HCWs can transmit HBV; informed consent is not possible if patients are not aware of HBV risk.</td>
<td>Only a few HCWs are prohibited from performing exposure-prone procedures with this strategy.</td>
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<td>3 HCWs rights are respected, patients are protected</td>
<td>Yes, to some extent</td>
<td>No</td>
<td>Yes</td>
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<td>HBV-infected HCWs are identified and counselled, confidentiality is maintained about their HBV status. Uninfected HCWs are advised to be immunised.</td>
<td>Most patients protected from transmission of HBV from HCWs, but less certain than with Strategy 2 and much less certain than with Strategy 1.</td>
<td>All HBV-infected HCWs cannot be trusted to refrain from performing exposure-prone procedures, thus exposing patients to infection. Informed consent is not possible if patients are not aware of risk of HBV.</td>
<td>HCWs need not fear for their jobs, and, if infected with HBV, can be relied on to take effective measures to prevent transmission of HBV to others doing exposure-prone procedures.</td>
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