Perceptions of orthopaedic surgeons regarding hepatitis C viral transmission: a questionnaire survey

GC WALLIS, WY KIM, BR CHAUDHARY, JJ HENDERSON

Department of Orthopaedics, Royal Bolton Hospital, Bolton, UK

ABSTRACT

INTRODUCTION Occupationally acquired hepatitis C viral infection is an important issue in surgery since there are no known vaccines or effective prophylaxis.

MATERIALS AND METHODS An anonymous questionnaire survey was performed to determine the attitudes and perception of risks of occupational acquired hepatitis C viral transmission in orthopaedic surgeons.

RESULTS A total of 763 questionnaires were posted to orthopaedic surgeons with various subspecialty interests and 261 surgeons responded (34.2%). Of respondents, 117 (47%) had sustained sharps injuries in the previous 12 months. Only 82 surgeons (33%) always reported such injuries, although 208 (84%) expressed concerns of occupationally acquired hepatitis C viral transmission. Orthopaedic surgeons were mostly unaware of the true prevalence of hepatitis C in high-risk groups, such as intravenous drug abusers.

CONCLUSIONS Greater awareness of all aspects of hepatitis C infection and its risks to the practice of surgery is required. Further debate is necessary on the role of routine testing of surgeons and patients.

KEYWORDS

Hepatitis C – Precautions – Transmission – Orthopaedic surgery

CORRESPONDENCE TO

GC Wallis, Department of Orthopaedics, Manchester Royal Infirmary, Oxford Road, Manchester M13 9WL, UK

M: +44 (0)7779 637150; E: GCWallis@doctors.org.uk

Hepatitis C viral transmission is an important issue in orthopaedic surgery since there are no known vaccines or effective prophylaxis. Orthopaedic surgeons are at risk of sharps injuries and, therefore, at risk of occupationally acquired viral transmission. Controversy exists as to whether hepatitis C infected surgeons should be transferred to low-risk duties.¹

The prevalence of hepatitis C infection is 0.07–1.4% in the general population,² although the prevalence of hepatitis C infection in a high-risk group, such as intravenous drug abusers, is much higher (44%).³ Studies have shown healthcare workers are at an increased risk of acquiring hepatitis C infection.⁴ The average risk of hepatitis C seroconversion following sharps injury from a hepatitis C positive donor has been quoted as up to 10%.⁵ When 3411 orthopaedic surgeons attending a recent conference were anonymously tested for hepatitis C, 0.8% were found to be infected. This rose to 1.4% with increasing age of the surgeon.⁶

The aims of our questionnaire study (Appendix 1) were to determine orthopaedic surgeons' perceptions and attitudes regarding the risks of hepatitis C viral infection as well as the precautions used against infection. It was hoped this

paper would stimulate debate regarding the role of routine testing of patients and surgeons.

Materials and Methods

Anonymous questionnaires were sent to all orthopaedic surgeons who were listed in the *British Orthopaedic Association Handbook* (2004) as members of the British Hip Society (BHS), British Trauma Society (BTS), British Association of Surgeons of the Knee (BASK) and British Society of Surgeons of the Hand (BSSH). The aim was to obtain a cross-section of sub-specialities in order to assess orthopaedic surgeons' perceptions as a whole. A total of 763 questionnaires were sent with 261 (34.2%) being returned within the designated period of 1 month. Twelve replies were from surgeons retired from practice, these being excluded from analysis. Therefore, 249 questionnaires were used in the analysis.

Results

The mean age of respondents was 50.7 years (range, 32–71 years), although 5 gave no answer. The mean number of

years as a consultant was 16.7 years (range, 1.5–37 years), with no answer in 15 replies. Subspecialty interests were hip and knee (193 replies), upper limb (73) and miscellaneous (96). Fifteen gave no subspecialty interest whilst 95 gave two or more.

Overall, 223 orthopaedic surgeons reported on the total number of sharps injuries or eye exposure incidents sustained in the previous 12 months. The mean was 1.4 incidents in the last year (range, 0–12). The mean number of incidents during an orthopaedic career was 15.7 (range, 0–300), although 85 surgeons did not answer. Eighty-two surgeons (33%) stated they always reported sharps injuries and eye exposure incidents. Of the 166 who did not always report incidents, 119 provided reasons for not doing so. The most common reasons were that the reporting system was too complex (43 answers), that reporting was not done if the donor appeared unlikely to carry hepatitis C (19), that there

was little point in reporting (including no current treatment; 14), and that solid sharps injuries were not reported (9).

Of the respondents, 208 (84%) stated a concern regarding transmission of hepatitis C to the surgeon due to occupational

Table 1 Patient factors regarded by orthopaedic surgeons as cause for concern regarding occupational hepatitis C exposure

Reason for concern given by orthopaedic surgeons	Number of answers given
Previous blood transfusion	15
Haemophiliacs	13
Homosexuals	12
Universal precautions should be adopted for all patients	11
Africans/immigrants	9
History of hepatitis B or HIV	8
Past medical history	3
Social circumstances	3
Body piercings	3
Foreign travel	3
Renal or liver disease	2
Alcoholics	2
Patient 'looks dodgy' (patient appearance)	2
Previous major surgery	2
Sexually transmitted disease or history	2
Male	1
Previous intubation	1
Specific illnesses (unspecified)	1
Prostitutes	1
Trauma patients	1
Amateur tattoos only	1
Immune compromise	1
Previous prison sentence	1
Patients who were young in the 1960s	1

Table 2 Reasons given by surgeons completing the questionnaire for and against the routine testing of orthopaedic surgeons for hepatitis C

Reasons stated supporting testing	Number of answers given
Avoid cross infection	19
We should know our own status	10
Should only be tested post exposure	4
Hepatitis C is as dangerous as hepatitis B	2
Only if evidence exists that testing protects patients	1
Patients have the right to know the surgeon's status	1
Only test if surgeon has a high-risk life-style	1
Increasing incidence of hepatitis C	1
Protect surgeons from lawyers/complaints	1
To show if they convert	1
Reasons against testing	Number of answers given
Patients are not tested	18
No risk to patient	13
No compensation for hepatitis C infected surgeons	7
No reliable treatment for hepatitis C, so why know?	6
Too expensive	4
Only test if all healthcare workers are tested	4
Surgeon is at more risk than patient	3
Would end your career	3
No policy exists for carriers	2
There are too many controls already	2
Alarmist	1
Risk of litigation	1
Witch hunt	1
If you test for hepatitis C you should test for HIV. Where stop?	1
Invalidates insurance	1
Only if whole population is tested	1
No relevance in practice if hepatitis C positive	1
Surgeons are unlikely to have hepatitis C	1
Makes no difference	1

Table 3 Precautions taken by orthopaedic surgeons when undertaking various surgical procedures

	Total hip replacement	Total knee replacement	Arthroscopies	Open reduction, internal fixation of fractures	Hand operations	Routinely
Eye protection	77.6%	79.2%	36.4%	68%	29.2%	35.2%
Double gloves	86%	87.2%	32.4%	79.6%	26%	31.2%
Impervious gown	80.8%	82.8%	74.4%	82.4%	56%	61.2%

Percentages are adjusted for those not undertaking certain procedures and for those not responding to this question.

exposure; 2 did not answer. Some 204 (82%) were concerned when operating on intravenous drug abusers, 113 (46%) were concerned about patients with tattoos and 68 (27%) were concerned about younger patients. Other causes of concern included previous blood transfusions (15), haemophiliacs (13), homosexuals (12), immigrants (9), or a history of hepatitis B or HIV (8). Eleven replies stated that universal precautions should be applied to all patients. Table 1 lists the reasons for concern given.

Eighty-five responders (36%) felt that orthopaedic surgeons should be routinely tested for hepatitis C as part of working practice. Sixteen did not answer the question, but the remaining 148 (59.4%) did not agree with testing surgeons. The comments regarding this question are listed in Table 4. The most common reasons supporting testing were to avoid cross infection (19), knowledge of own hepatitis C status (10), and because hepatitis C is as dangerous as hepatitis B (2). Reasons against testing included the fact patients are not tested (18), no evidence of risk to patients (13), lack of compensation (7), lack of treatment in the event of a positive result (6), the cost of testing (4) and the damage to one's career (3). Table 2 lists all reasons given for and against testing of orthopaedic surgeons.

Of the respondents, 122 (59%) felt that hepatitis C positive surgeons should be restricted to low-risk procedures. Forty-one did not answer and the remaining 86 (35%) felt there should be no such limitation. With regard to pre-operative testing of high-risk patients, 177 respondents (77%) felt this was appropriate although 18 provided no answer. Of responders, 186 gave an estimate of population incidence of hepatitis C whilst 177 estimated the incidence of hepatitis C in intravenous drug abusers. The mean estimated population prevalence of hepatitis C was 3.5% (range, 0.01–20%) and the mean estimated incidence in drug abusers was 30.4% (range, 2–100%).

The precautions taken by orthopaedic surgeons undertaking various procedures are shown in Table 3. These figures are adjusted to take into account procedures which

some surgeons in the survey undertake and others do not. Surgeons performing hand surgery were least likely to use eye protection, double gloving or impervious gowns, whilst those performing knee surgery were most likely.

Discussion

Occupationally acquired hepatitis C viral infection is an important issue in surgery since there are no known vaccines or effective prophylaxis. Hepatitis C viral infection does not usually cause an acute hepatitis and asymptomatic infection is common. There is a tendency to chronic infection leading to liver cirrhosis in 10–20% of chronic cases. Diagnosis of hepatitis C is possible by demonstrating anti-hepatitis C antibody in serum, although ELISA and PCR can identify the viral RNA itself. Hepatitis C viral infection occurs by blood-borne transmission and has a relatively short incubation period of 40–55 days.

The risk of infection with hepatitis C by occupational exposure depends on three factors: (i) the prevalence of hepatitis C in the population; (ii) The number of exposure incidents a healthcare worker experiences; and (iii) the seroconversion rate (transmission rate) of hepatitis C with a single exposure. The risk from each exposure can be expressed as the factor of population prevalence and seroconversion rate. The risk of hepatitis C seroconversion following sharps injury from a hepatitis C positive donor has been estimated as 1.9% in longitudinal and prospective studies (95% CI 1.4–2.5%; range, 0–22%)⁴ although rates up to 10% have been quoted.⁴ Using the lower figure, the risk of seroconversion from a single exposure would be 0.133% (0.07% x 1.9%). The average number of career exposure incidents in our questionnaire was 15.7, making the career risk of hepatitis C seroconversion approximately 2.1%. Of sharps injuries, 85% are caused by suture needles⁷ which carry a lower risk of transmission of hepatitis C and the true risk of seroconversion may, therefore, be lower.

It can be noted that there is a wide variation in the number of incidents (eye exposure and sharps injuries) both over the preceding 12 months and over the surgeons' careers. These variations in incidents had no relationship to age or number of years as a consultant. It must be assumed that some of this variation is due to surgical practice as well as some procedures being more at risk from sharps injuries than others.

The low rate of reporting of sharps and eye exposure incidents (33% in our sample) is greatly different from the fact that 84% of orthopaedic surgeons were concerned about occupational hepatitis C exposure. This is comparable to previous studies which have shown that most surgeons are concerned regarding risks of blood-borne viral transmission during surgery whilst failing to comply with the recommendations regarding universal precautions and reporting of sharps incidents.⁸

Whilst only 36% felt it was reasonable to test surgeons routinely for hepatitis C, 77% stated that patients perceived as high-risk should be tested pre-operatively for hepatitis C. This either illustrates the greater concern surgeons have for their own safety, or the perception that risk of transmission is greatest from patient to surgeon. The population incidence of hepatitis C was overestimated in our study (mean of 3.45% compared to population incidence of 0.07–1.4%). The incidence of hepatitis C in intravenous drug users was estimated as 30.4% (mean) in our sample compared to a true prevalence of 44%³. Of respondents, 59% felt that hepatitis C positive surgeons should be restricted to low-risk procedures. Heptonstall¹ suggested that transmission was possible and infected surgeons should be transferred to low risk duties, whilst Cockcroft⁹ felt risks of transmission were too small to limit surgeons to low risk duties. Whilst evidence of the risk of surgeon-to-patient transmission is conflicting, current UK Department of Health guidelines state that healthcare workers carrying hepatitis C should not perform exposure-prone procedures.¹⁰

Many orthopaedic surgeons routinely operate without eye protection or double gloving even when performing procedures where power tools are employed. Of surgeons responding to the questionnaire, 67% did not routinely report sharps injuries or eye contaminations. The most commonly given reasons for this were the complexity of the reporting procedure or lack of motivation to report. Double gloving is easy to adopt and has been shown to be effective in reducing viral transmission.¹¹ Many orthopaedic surgeons appear to be putting themselves at risk of hepatitis C infection by not adopting this practice. Whilst there is no proven post-exposure prophylaxis for hepatitis C, the use of interferon monotherapy may be indicated.¹² It is vital surgeons and other healthcare workers are aware of this as the earlier the treatment is started, the more effective the treatment.¹² A fear of stigmatisation and loss of employment may play a significant role in this reluctance to report incidents.

The main limitation of our study was the disappointing response rate of 34.2%. It is possible that those who did not return the questionnaire were not concerned about risks of occupationally acquired hepatitis C viral infection.

Conclusions

Hepatitis C has no effective vaccine, unlike hepatitis B. Healthcare workers in the NHS are required to be vaccinated against hepatitis B and their serological response to the vaccine is checked. In addition, hepatitis B carrier status is tested for in healthcare workers performing exposure-prone procedures and those found to be positive for e-antigen (HBeAg positive) are excluded from invasive procedures.¹⁵ Effectively, this is a screening surgeons for hepatitis B. There have recently been calls to introduce screening for hepatitis B as part of entry requirements to medical school. No such screening occurs for hepatitis C. HIV infection in healthcare workers should also result in a withdrawal from exposure-prone procedures¹⁴ but is not currently tested for except after certain exposure incidents.

It appears many orthopaedic surgeons are ignorant of the incidence of hepatitis C and effective measures to reduce the risks of occupational exposure are not always used. More information on this blood-borne viral infection should be made available.

Further data are required regarding the risks of transmission of hepatitis C between surgeons and their patients to allow informed debate on the role of routine testing of trainee and consultant surgeons. This would impact on whether surgeons who are hepatitis C positive require a change in their profession. In the meantime, it seems reasonable to adopt all possible precautions against this career-threatening, and potentially life-ending, infection.

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Questionnaire used in the survey to assess orthopaedic surgeons' opinions and practice regarding occupational exposure to hepatitis C

Others (please specify)