SUMMARY OF QUESTIONS

Questions & Answers

Is segregation of Anti-HCV positive patients absolutely required, or are universal precautions sufficient?

Dr. Jadoul: If we were to isolate everybody who was hepatitis positive, in its many combinations, such as B+C-. B-C+, B-C, B+C+, etc., how would we be able to actually do this? Note that there is a long interval between hepatitis infection and seroconversion. Because hepatitis C (hep C) has a lower infectivity than hep B, it might not be worthwhile isolating patients based on their hep C status.

What is the period of time between hep B infectivity and seroconversion? How long do you isolate a patient coming back from high prevalence area for HBV and HCV?

Dr. Jadoul: ELISA 2 will detect anti-hep antibodies at 246 days. ELISA 3 is able to detect anti-hep antibodies as early as 154 days. Therefore, there are up to five months in which the patient may transmit the disease because the tests have not yet shown that patient to be hep C-positive.

If we isolate these patients, we run the risk of individuals throwing hygienic precautions to the wind. There is also a significant added cost of isolation, as well as the psychological impact of isolation on the patient. No isolation is the gold standard for hep C.

Should we test dialysis patients returning from certain countries? With patients frequently travelling to countries with higher prevalence of HBV, HCV, what are your recommendations for screening upon their return? Besides liver function test and serology testing, what other blood testing is recommended for these travelling patients?

Dr. Jadoul: For hep B status, assay for the HBS Ag upon the patient's return and again two to four weeks later. I recommend the HBS Ag test as a starting point because it's not too expensive. A PCR could also be done, but it is a lot more costly. One could also test ALT levels. High levels mean more testing should be done.

I wouldn't recommend testing a returning patient for hep C unless that patient is on the transplant list.

There is a test in development that will measure all three of HBV Ab, HBC Ab, and the HBV core antigen (HBVc Ag).

What is your recommended policy about the consumption of food in the dialysis unit, including patient snacks and staff breaks?

When dialysis patients eat during dialysis, their blood pressure crashes. With vasodilation, there is a decrease in blood pressure if the patient eats just before or during the dialysis session. Therefore, it is preferable if patients don't eat during or just before dialysis.

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Is there a need to dedicate a machine for Hep B-positive patients if the machine is disinfected between patients? -Is there no faith in the disinfection process?

Dr. Jadoul: Keep in mind that the virus is blood-borne. Blood spills, etc. are usually on the outside of the machine. This is particular true for surfaces and items that can be touched/used by hep-negative and hep-positive patients. HBV is relatively stable in the environment and remains viable for at least 7 days on environmental surfaces at room temperature. HBsAg has been detected in dialysis centers on clamps, scissors, dialysis machine control knobs, and doorknobs. Thus, blood-contaminated surfaces that are not routinely cleaned and disinfected represent a reservoir for HBV transmission. Dialysis staff members can transfer virus to patients from contaminated surfaces by their hands or gloves or through use of contaminated equipment and supplies

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If you vaccinate most patients, most should have anti-HBV antibodies.

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Dr. Tam: Isolate the non-seroconverters (i.e., those who are HBV antibody-negative).

Dr. Jadoul: Separating patients who are infective with Hep B from those who are susceptible is key.

Why do we disinfect between positive patients and not just at the end of the day?

Dr. Tam: It is not necessary to disinfect after every patient. Blood spills, etc. are usually on the outside of the machine, but we tend to concentrate on the inner workings of the machine. We should be paying more attention to the disinfection of surfaces than we maybe currently are doing. This is particular true for surfaces and items that can be touched/used by hep-negative and hep-positive patients.

Is there good evidence that certain dialyzers remove hep C virus? Is there evidence of a clinical benefit for patients?

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Dr. Jadoul: I don't know. Even with high-flux dialyzers, it seems that HCV does not cross the membrane.

Heparin is an inhibitor of PCR. Therefore, if you analyze for HCV using PCR, you may get a false negative. It would be preferable to take a sample of peripheral blood before dialysis for analysis.

If certain dialyzers do remove HCV, the clinical benefit to the patient would be that his or her viral load would be reduced during the dialysis session. It is interesting that during a high-flux dialysis session, gamma-interferon levels increase, and this is not just due to a concentration effect. This may account for the apparent decrease in HCV viral load during dialysis.

Would it make sense to periodically test for HBV/HCV DNA using pooled patient specimens from dialysis units in view of surface antigen mutations?

Dr. Jadoul: I don't believe this would serve any purpose. There is no documentation of nosocomial transmission of a mutant virus. The pooled approach might be useful to detect if new variants of the virus are being introduced.

What if we consider the presence of a mutation in a susceptible population? For example, a patient returns from India. Is it prudent to perform a PCR upon that patient's return? Well, if the PCR is negative, the risk is low. But the window with ELISA testing is five months.

What is the rate of mutation of the hep B virus? Are seroconverted patients for hep B still protected?

Dr. Jadoul: Various hepatitis virus mutations remain unusual, and many mutations are not prevalent enough to suggest changes to policies.

Molecular virology can be useful in elucidating the source. For example, we once saw an unusual genotype from Vietnam in a transplant patient. The patient had emigrated 10 years earlier from Vietnam. We therefore assumed that immunosuppression that had occurred post-transplant had allowed the virus surface. This showed us that the patient had not contracted it in the unit.

We currently vaccinate for hep B when the patient is on hemodialysis. The hospital pays for the first dose and public health provides the second and third doses. The studies you presented showed lower conversion the lower the GFR. Therefore, it would seem more beneficial to vaccinate earlier on at the CKD pre-dialysis stage. Can you comment? Is there any literature supporting when the best time is to give the hep B vaccinations (i.e., pre-dialysis, post-dialysis, non-dialysis)?

Dr. Charest: It is unclear when we should vaccinate patients with respect to the hemodialysis procedure. It is more practical to do it pre-HD. There is a risk of hematoma if done after HD in patients using heparin during the procedure. There is evidence that some of the antigen

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load is present in the patients' blood as occurrence of false positive for HBs antigen are well described in the literature. Theoretically, it means that some of the antigen load could be lost during the dialysis procedure if vaccination is done pre-HD. The extent of this loss may be known, but I am unaware of it.

With respect to timing of vaccination with respect to progression of renal failure, five small studies have been done to determine optimal timing for immunization of renal patients. Although it seems that there is general agreement that vaccination done at a stage before ESRD gives better conversion rate, there is no clear evidence that patients with CKD (but not ESRD) respond better than ESRD patients. No head-to-head studies have been conducted between vaccination of CKD and ESRD patients.

I believe it is better to immunize pre-dialysis, but ultimately, I think the fact that we are doing it—rather than when we are doing it—is what is really important.

Can you interchange Engerix with Recombivax? Our program gives Engerix to our pre-dialysis clinic at each visit (therefore, 0, 3, 6, and 12 months)—not as recommended. Any comments/statistics to support this practice?

Dr. Jadoul: Only one paper comparing these two vaccines has been published. In this trial, two patient groups were compared, and the results showed that Engerix gave a better response -. However, there is a gap in this study. The patients in the two treatment arms were not age- and sex-matched. Nonetheless, even when the results were adjusted for age and gender, Engerix still gave a slightly better response.

Dr. Charest: I don't believe there is a difference between the two vaccines. It is conceivable that Engerix appears slightly better because it is administered in four doses as opposed to three doses (Recombivax). I believe that increasing the number of doses may be advantageous.

If Engerix is administered pre-dialysis at 0, 3, 6, and 12 months, there is no literature to suggest this is beneficial. Nor is there literature to indicate that it is not beneficial. I believe, however, that the immune response may be slightly better pre-dialysis.

We have to consider that pre-dialysis patients may never make it to dialysis; many die before dialysis due to cardiovascular disease. Up to 80 to 90% of stage 3 and 4 CKD patients never get to dialysis. Therefore, does it make sense to vaccinate these patients? We do not vaccinate old patients who have co-morbidities and low GFRs because many of them will die before they are put on dialysis.

If one plans a dialysis unit, there are usually one to three isolation rooms. With MRSA/VRE in dialysis units as well as hep B-positive patients, how many isolation rooms should one plan for?

Dr. Jadoul: We are generally building dialysis units with one to three isolation units. I believe this is a good number.

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Dr. Charest: I agree that isolation rooms are required, but the number of rooms need in a unit depends on the types of diseases you think you will encounter in the unit.

Dr. Jadoul: We only isolate hep B-positive patients. In our unit, the nurses who are handling MRSA-positive patients wear a different hat than the other nurses. This serves largely as a reminder to them to frequently wash their hands. To my knowledge, there is no evidence for the transmission of MRSA among dialysis patients. However, in my country [Belgium], there is a much lower incidence of MRSA in patients than in the United States. We estimate the 5-10% of staphylococcus carriers might be MRSA.

Dr. Wu: What about respiratory infections in dialysis units? For example, influenza, where immunization is standard?

Dr. Jadoul: Staff members and patients should be vaccinated. However, the vaccine is not entirely effective (just as it is not entirely effective in the general population).

Dr. Jadoul: Hep B is highly infective. Therefore, you should try to separate patients geographically and by time. Alternatively, all external surfaces should be cleaned and disinfected. Staff members should be segregated. Overall, I believe isolation is very important because of the high infectivity of hep B.

Dr. Charest: Surveillance data have shown that if patients are isolated, there is reduced transmission of HBV. The incidence of HBV declined once isolation was implemented, but before patients were vaccinated against hep B. Therefore, isolation seems very important.

What about using Twinrix to vaccinate new patients against hep A and hep B?

Patients coming from hep A-endemic areas probably already have anti-hep A antibodies if they grew up in that region. Therefore, it might not serve any purpose to use the dual vaccine in these patients.

What about screening staff?

Dr. Jadoul: We screened 120 nurses in the early 1990's for hep C. Five or six of those screened nurses were hep C-positive. However, those nurses had worked in the unit a lot longer than other staff.

So what if we have HCV-RNA-positive staff? Is there a risk for transmission to a patient? Well, there is no evidence that it plays a role in hemodialysis and there is only one case that was associated with invasive surgery.

What about transmission of hep B from staff to patient? Well, the risk is higher than the risk associated with hep C, and it may be prudent to have hep B-positive staff refrain from performing certain procedures.

Dr. Tam: It is extremely rare. If a staff member is hep B-positive, he or she must report to the

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college and the college decides what that staff member can and cannot do in the dialysis unit.

Dr. Taylor: It depends on a person's e-antigen status. If an individual is e-Ag-positive, that person cannot do procedures where they cannot see their hands at all time (e.g., gynecological surgery that is done deep in the pelvis. In Alberta, there are no restrictions for nurses.

Dr. Danny Chan: Canadian Blood Services does core IgG screening for hep B. Hep B core Ab positive blood is rejected for transfusions because of the risk of latent infection. We can use IgM or IgG to determine if it is a recent infection.

What if you have a febrile episode in a CVC (central venous catheter) cuffed patient? What drug should you use?

Dr. Taylor: The drug of choice will depend on different factors, such as the incidence of MRSA. If there is high MRSA, vancomycin should be administered pending blood culture results. If MRSA is low, you can use a narrower spectrum drug, such as sulphasalazine. Gram-negative BSIs are quite rare.

Dr. Wu: The dosing of cephalosporin in hemodialysis patients is tricky. With coagulase-negative staphylococcus, use 1 week IV vancomycin therapy with two weeks of follow-up therapy.

What can we do to guard against bacterial infections, particularly VRE and MRSA, in dialysis units?

Dr. Taylor: I would probably recommend screen patients who are new to the unit who have come from other units. If you don't have a VRE-positive population in your unit, your main focus should be to keep it out. In the face of an outbreak, you should do a prevalence surveillance survey. Barrier precautions should be taken. Over time, people will normally clear the infection, but the bug can remain colonized.

There is very little evidence suggesting MRSA transmission in an outpatient setting. The question can be posed, though: Is the hemodialysis unit equivalent to an outpatient setting? Regardless, I suggest erring on the side of caution and isolating the MRSA patient in the hemodialysis unit, just as in-patients would be isolated.

What about satellite hemodialysis units who have no means to isolate patients. How should those units deal with MRSA-positive patients?

Dr. Taylor: We need to come up with ways to manage it in the unit so that the patient doesn't have to move to an area where the hemodialysis unit has isolation.

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What about tuberculosis among the hemodialysis population?

Dr. Taylor: Patients with TB constitute an immunocompromised population and their exposure is based on where he or she was born. Each hemodialysis patient should be assessed as to his or her TB status using the TB skin test or the QuantiFERON®-TB Gold Test, which is superior to the skin test. However, it should be known that some patients may have anergy for TB skin test even though they have tuberculosis. Therefore, I would suggest the TB skin test, and/or the QuantiFERON-TB Gold Test, along with a chest X-ray. Based on the results, you then need to come up with prophylactic regimens.

How do I treat a dialysis patient with diarrhea who is VRE- and C. difficile-positive? This patient has failed with metronidazole (first-line therapy). Is it OK to use vancomycin in this patient?

Dr. Taylor: Yes, in this case, it is prudent to use the vancomycin to eradicate the C. difficile. However, in some parts of Canada, it is necessary to first use two courses of metronidazole before moving to vancomycin therapy.

Does the use of vancomycin promote vancomycin resistance? The evidence is not clear. In the case you have described, the patient already has VRE, so it is probably OK to use vancomycin to eradicate the C. difficile.