Comment on: Pesticide-Poisoned Patients: Can They Be Used as Potential Organ Donors?

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To the Editor:

We read with interest the review article by Mistry et al. [1] on solid organ donation from patients who died from pesticide poisoning. To this end, the authors found that one donor was poisoned with brodifacoum (BDF), a long-acting, second-generation anticoagulant lipophilic rodenticide that accumulates preferentially in the liver [2, 3]. However, review of the literature indicates that BDF poisoning led to death of two additional patients from whom multiple organs [4] and two kidneys [5] were procured.

Interestingly, Emre et al. [2] observed a transient vitamin K1-responsive coagulopathy during post-transplant reperfusion despite undetectable brodifacoum in the blood (< 4.0 ng/mL). The authors hypothesized that this phenomenon was related, in part, to residual BDF in the transplanted liver that cleared after the operation. To this end, Ornstein and her colleagues [4] reported high post-operative international normalized ratio (INR) in the liver recipient but not in those transplanted with other organs procured from the same BDF-poisoned decedent.

It is well established that BDF poisoning increases circulating vitamin K 2,3-epoxide/vitamin K ratio because it potentially inhibits vitamin K 2,3-epoxide reductase (VKOR), an enzyme that reduces vitamin K after it has been oxidized while carboxylating glutamic acid residues in vitamin K-dependent blood coagulation factors in the liver [3, 6]. To this end, Park et al. [7] reported high plasma concentrations of vitamin K 2,3-epoxide lasting more than 18 months in two factory workers accidentally exposed to BDF during manufacturing.

Prothrombin time and circulating vitamin-K-dependent clotting factors were within the normal range in both cases. Unfortunately, plasma BDF concentrations were not determined. These data indicate that vitamin K metabolism in BDF-poisoned patients is still perturbed long after circulating vitamin-K-dependent clotting factors have returned to baseline values.

Accordingly, we propose that INR, circulating BDF concentration, and plasma vitamin K 2,3-epoxide/vitamin K ratio should be monitored closely in recipients of liver from BDF-poisoned decedents. If post-operative INR is normal and circulating BDF undetectable while plasma vitamin K 2,3-epoxide/vitamin K ratio is high, high dose supplemental vitamin K1 should then be administered until the ratio reverts [3]. In addition, to estimate BDF burden in a transplanted liver that may adversely affect post-operative elaboration of vitamin K-dependent coagulation factors, BDF concentrations in both effluent fluid after flushing donor's liver and University of Wisconsin cold preservation solution should be determined before the operation.

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Compliance with Ethical Standards

Conflicts of Interest None.

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