Vodka to prevent postoperative adhesions: Another unsuspected cardiac benefit of alcohol

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The prevention of postoperative adhesions to make sternal re-entry safer and to avoid its potentially associated life-threatening complications has been a longstanding endeavor in cardiac surgery. The multiplicity of the proposed strategies, which range from the topical application of agents stimulating the pericardial fibrinolytic function by mesothelial cells¹ to the placement of resorbable² or nonresorbable³ pericardial substitutes, clearly demonstrates that none of these strategies has proven convincing enough to gain wide clinical acceptance. On the basis of the study of Lassaletta, Chu, and Sellke,⁴ it would seem that this list of compounds and devices can now be completed by...vodka.

In this provocative study, the authors first subjected swine to a 4-week hypercholesterolemic diet before inducing chronic myocardial ischemia by placement of an ameroid constrictor around the circumflex coronary artery. While the hypercaloric regimen was continued, the animals were then given either red wine or vodka to drink, and a third group served as control. After 7 weeks of these regimens, the animals were reoperated on and those that had received vodka were then found to have much less severe pericardial adhesions than their counterparts in the 2 other groups, as assessed by a macroscopic grading system. Histologically, vodka intake was also associated with a reduction in fibrosis and transmural collagen expression whereas there were no significant between-group differences in the expression of several proteins involved in focal adhesion.

This study is certainly original at least for 2 reasons. First, it has usually been considered that a local problem, that is, the formation of pericardial adhesions, needed to be fixed by a local solution. The present study challenges this concept by suggesting a potential benefit of a systemic intervention. In that, its findings are consistent with those of Meisel and coworkers,⁵ who have shown, in a rabbit model, that the systemic administration of the tyrosine kinase receptor inhibitor sunitinib could effectively reduce

postoperative pericardial adhesions. However, it is likely that to be safe and effective, a systemically delivered drug should have strictly site-specific effects, and such a drug still needs to be found.

The second original feature of this study pertains to the tested interventions, that is, red wine and vodka. It is noteworthy to remember that the initial plan of the authors was to assess the cardioprotective and angiogenic effects of different alcohol-containing substances and that only the unexpected finding that, at the time of reoperation, the vodka-treated swine experienced far less serious adhesions than animals of the 2 other groups led to the hypothesis that there was possibly a causal relationship between the intake of vodka and the limitation of a pericardial inflammatory reaction. Although the authors should be complimented for this ingenious deduction, the flip side of the coin is that the protocol had not been initially designed for looking at this specific end point and has thus some limitations that raise a cautionary word about the conclusions.

Indeed, the major limitation pertains to the applicability of the authors' conclusions to the patients currently at risk of reoperation. These patients are primarily children undergoing palliative operations for congenital heart defects and young adults in whom a specific reason has dictated the use of a bioprosthetic valve. In both settings, one would expect most of these patients to be free from ischemic heart disease and major lipid abnormalities. Thus, it remains uncertain that the findings made in a model combining hypercholesterolemia and myocardial infarction are relevant to these patient subgroups. Another subset of patients prone to be reoperated on are those undergoing placement of a temporary mechanical assist device, but giving them vodka seems at best unrealistic even though the blood ethanol levels of the treated animals are reported to fall in the "moderate consumption" range. Finally, patients who previously underwent bypass and who may subsequently require a valve replacement/repair or elderly subjects with a degenerated bioprosthesis, that is, patients whose profile would be closer to the preclinical model tested in this study, will likely undergo fewer reoperations in the future because of the growing use of transarterial valve implantation.

Additional limitations of the study include the lack of randomization (it is surprising that the *nonblinded* assessment of adhesions showed that the vodka group was superior to the red wine group whereas the subsequent *blinded* assessment of fibrosis failed to show the expected parallel decrease in fibrosis, which was actually similar in the 2 groups), species-specific differences in the formation of

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postoperative adhesions, the lack of cardiopulmonary bypass (and its related inflammatory changes), the potentially confounding effect of the superimposed infarction on the assessment of fibrosis, the uncertain interaction between the hypercaloric diet and the adhesiolytic properties of vodka, and the rather crude assessment of the histologic changes. In particular, it is regrettable that the authors did not assess whether the purported benefits of vodka intake translated into the restoration of a layer of mesothelial cells whose secretion products may enhance the clearance of fibrin and reduce adhesions. Finally, because of its merely observational nature, the study fails to provide insightful mechanistic insights that would support the use of vodka as an antiadhesion agent, and from this standpoint it would certainly be useful to try to dissect out the compounds present in vodka that might account for its adhesiolytic properties.

Nevertheless, the authors should be complimented for fueling the evolving field of research on adhesion prevention

with this truly original hypothesis. Although it appears difficult to consider a prospective randomized controlled study to assess the clinical relevance of these findings, the retrospective comparison of difficulties in dissecting postoperative mediastinal adhesions in abstinent and alcohol-consuming patients might yet provide some hints!

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