Title: Venous gas emboli and complement activation after deep repetitive air diving

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Abstract: Complement activity has been linked to decompression sickness (DCS), but the effects of intravascular bubbles on complement activation are poorly understood. We have investigated intravascular complement activation by measuring red blood cell (RBC)-bound C3d after repetitive air diving in man. Subjects were exposed to a single, 20 min, 170 fsw (feet of sea water) dive, or to 2 such dives with a 6-h surface interval. Doppler monitoring for venous gas emboli was performed postdive. Predive blood samples were studied to determine sensitivity of complement to activation by air bubbles. Other predive and postdive venous samples were evaluated for intravascular complement activation. No cases of DCS occurred in 39 dives. Baseline complement sensitivity appeared normally distributed, thus "sensitive" and "insensitive" subjects were not clearly distinguishable. RBC-bound C3d did not increase after 1 dive but did increase after the repetitive dive (P less than 0.05). Furthermore, maximum bubble grade was independent of complement activation.

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