P037 Exposure to hyperbaric oxygen induces platelet aggregation and protein release

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HBO therapy is used as a treatment for chronic wounds arrested in the inflammatory phase. Platelets are rapidly recruited to sites of inflammation and influence the response of other cell types, therefore the effect of therapeutic doses of HBO on platelet physiology was investigated. Human platelets were exposed to HBO (97.7% O_2, balance CO_2 at 2.2 ata) or CON (5% CO_2, balance air at 1 ata) for 90 min. HBO treatment induced 29.8 $\pm$ 3.0% of platelets to aggregate compared with 5.5 $\pm$ 0.9% in the control. Using 2-D PAGE, proteins released in different abundance from HBO- and CON-treated platelets were excised and identified using LC-MS/MS and database mining. Caeruloplasmin and antithrombin III were among those released from platelets exposed to HBO, but not CON. Exposure to HBO did not cause platelet activation as measured by surface expression of CD31, CD62P and binding of PAC-1 antibody to the activated form of $\alpha_{IIB}\beta_{IIIa}$. Part of the beneficial effect of HBO may be due to release of proteins involved in the wound healing response. Further study will better define the precise mechanisms and effects of HBO on platelet function.