MITOGEN-INDUCED LYMPHOCYTE TRANSFORMATION DURING HAEMODIALYSIS

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During haemodialysis contact with artificial membranes may result in activation of various humoral effector mechanisms and in alteration of cellular components. Thus, it was of interest to study: a) the influence of haemodialysis on mitogen-induced lymphocyte transformation (LT) and b) the influence of patients' plasma drawn at different times during haemodialysis on LT of control lymphocytes.

Thirteen HbsAg-negative patients on regular haemodialysis treatment were studied. Dialysis was performed with hollow-fibre artificial kidneys (regenerated cellulose) for six hours, three times per week. A whole blood micromethod [1] was used to study PHA-, ConA- and PWM-induced lymphocyte transformation in the patients during haemodialysis. For evaluation of the influence of patients' plasma on lymphocyte reactivity mitogen-induced lymphocyte transformation was studied in isolated normal lymphocytes [2]. These were incubated with patient plasma drawn at different times during haemodialysis and stimulated with PWM and ConA. Blood was drawn before (time 0) as well as 30, 60 and 240 minutes after onset of haemodialysis.

A markedly decreased pre-dialysis PHA-, ConA- and PWM-induced lymphocyte transformation was observed in the patients compared with healthy controls. After 30 minutes of haemodialysis a further significant reduction in mitogen-induced lymphocyte transformation was observed. Sixty minutes after onset of haemodialysis lymphocyte transformation returned to pre-dialysis levels and showed an additional marked increase 240 minutes after onset of dialysis (Figure 1 (a)).

Incubation of control lymphocytes with plasma drawn 30 and 60 minutes after onset of haemodialysis resulted in a significant reduction of both PWM and ConA-induced lymphocyte transformation (Figure 1 (b)). However, in the PWM-system the decrease of LT did not reach significant levels, since a rather wide variation of individual lymphocyte transformation values was observed. Plasma drawn 240 minutes after onset of haemodialysis had no significant effect on lymphocyte transformation of controls.
Figure 1. (a) Mitogen induced lymphocyte transformation during haemodialysis (Mean ± SEM)

Figure 1. (b) Influence of HD-patients' plasma on LT of control-lymphocytes (Mean ± SEM)
Conclusion

Lymphocyte transformation was markedly decreased 30 and 60 minutes after onset of haemodialysis in both the autologous whole blood test-system and in control lymphocytes incubated with patient plasma drawn at the respective times during haemodialysis. Thus, activation of serum factors seems to account for the significant reduction of mitogen-induced lymphocyte transformation observed shortly after onset of haemodialysis, although mechanical alteration of lymphocytes by contact with dialysis membranes cannot be completely excluded.

References