Mild renal dysfunction is sufficient to induce erythropoietin deficiency in patients with unexplained anaemia

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Current guidelines suggest that anaemia due to erythropoietin deficiency almost exclusively occurs with creatinine concentrations of at least 177 micromol/l or above. The aim of this prospective case control pilot study was to evaluate whether borderline renal function or mild renal dysfunction with creatinine concentrations well below 177 micromol/l is sufficient to induce inadequate erythropoietin secretion. Patients referred for work-up of otherwise unexplained anaemia with mildly abnormal creatinine concentrations (104-129 micromol/l; study group: eight patients) and patients referred for work-up or therapy of other diseases who also presented with anaemia but normal creatinine levels (<100 micromol/l; control group: nine patients matched for gender, age and degree of anaemia) were included. All but two patients in the control group had bone marrow biopsies to exclude other pathologies. Mild renal dysfunction (as evidenced by creatinine concentrations between 100 and 140 micromol/l, median concentration 112 micromol/l) was found to be sufficient to induce inadequate erythropoietin secretion. The physiologic hemoglobin-dependent erythropoietin regulation demonstrated in the control group was abolished in the study group. Patients with mild renal dysfunction and unexplained anaemia should be investigated for erythropoietin concentration. If the erythropoietin concentration is found to be inadequate for the degree of anaemia, substitution therapy should be considered.