

FERTILITY-RELATED HORMONES

AFTER A SUCCESSFUL RENAL TRANSPLANTATION

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Introduction

Female fertility is severely reduced in women with end stage renal disease (ESRD)¹. Uremia also influences male fertility. This is however much less described. Disturbances in the hypothalamic-pituitary gonadal axis is one factor to consider in male infertility among patients with kidney disease². Earlier studies have shown elevated levels of follicle stimulating hormone (FSH), luteinizing hormone (LH) and prolactin¹. It is also known that men with renal failure have lower levels of testosterone compared to healthy men. Antimüllerian hormone (AMH) is a 140 kDa glycoprotein that is excreted from the male Sertoli cells. We have recently for the first time shown that AMH is reduced by 60% among male patients with ESRD³. In this present study we have investigated the fertility-related hormonal changes that occur during and after a successful renal transplantation.

Material and methods

10 male patients with ESRD have been included in the study. They were all transplanted with a living donor. We analyzed plasma creatinine, cystatin C, albumin, FSH, LH, sex hormone binding globulin (SHBG), prolactin, testosterone and AMH. The blood samples were drawn in the morning before surgery, at blood release to the graft, 1 hour after blood release, 8 hours after blood release, in the morning day 2, 3, 4, 7 after surgery as well as after 3 and 12 months.

Results

All of the patients showed immediate graft function with rapidly decreasing creatinine and cystatin C levels. Along with the decreasing creatinine levels we saw decreasing median values of prolactin during the first week after transplantation. Thereafter, the plasma levels of prolactin began to rise again to a value about 80% of the pretransplantation values. Plasma testosterone rapidly decreased by 60% during the first two days after transplantation. Thereafter, it began to rise and three months after transplantation the median values were higher than before transplantation. Plasma LH decreased rapidly by more than 50% during the first two days after transplantation.

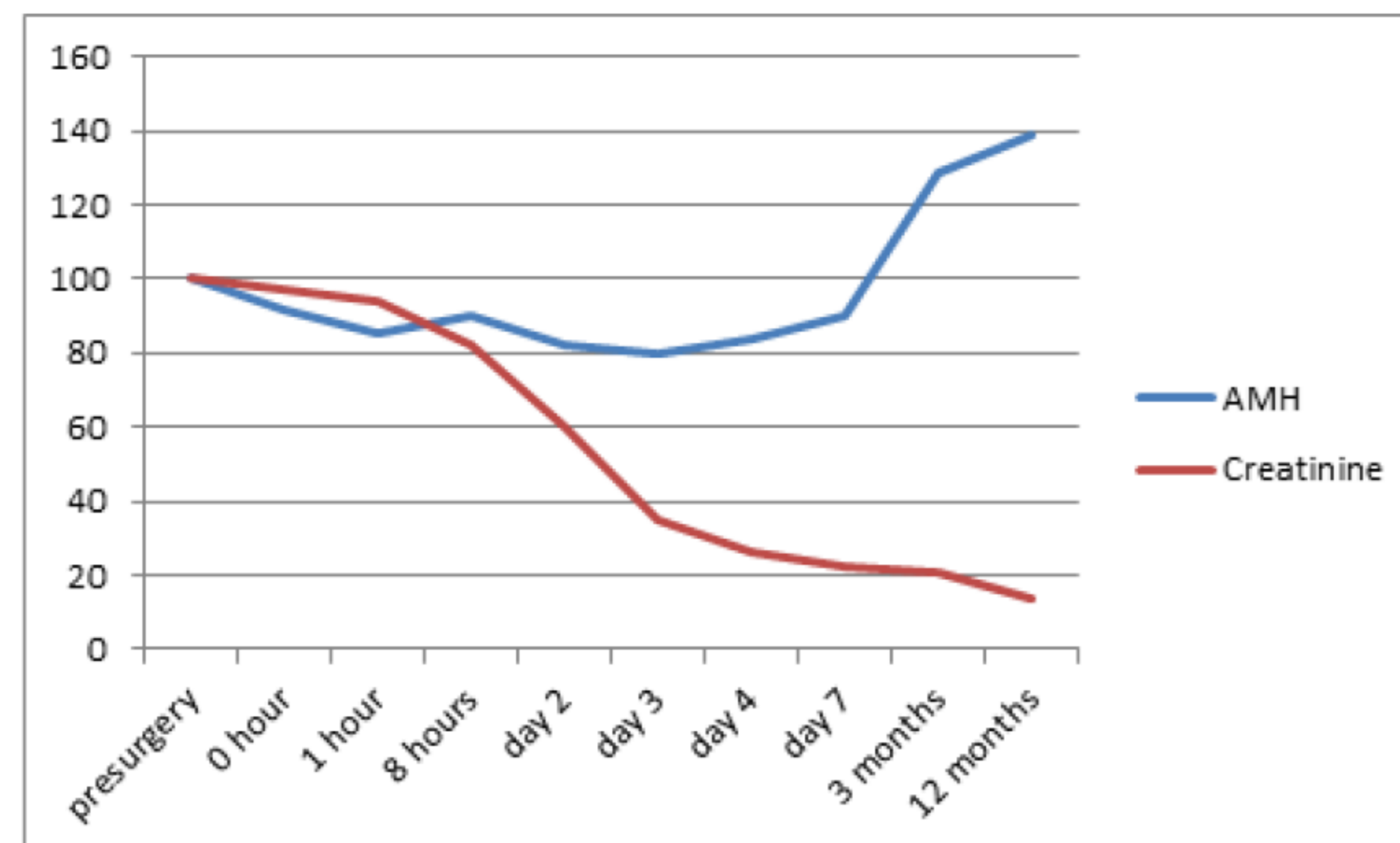


Fig 1. Median values of AMH and creatinine calculated as percentage of pretransplant value

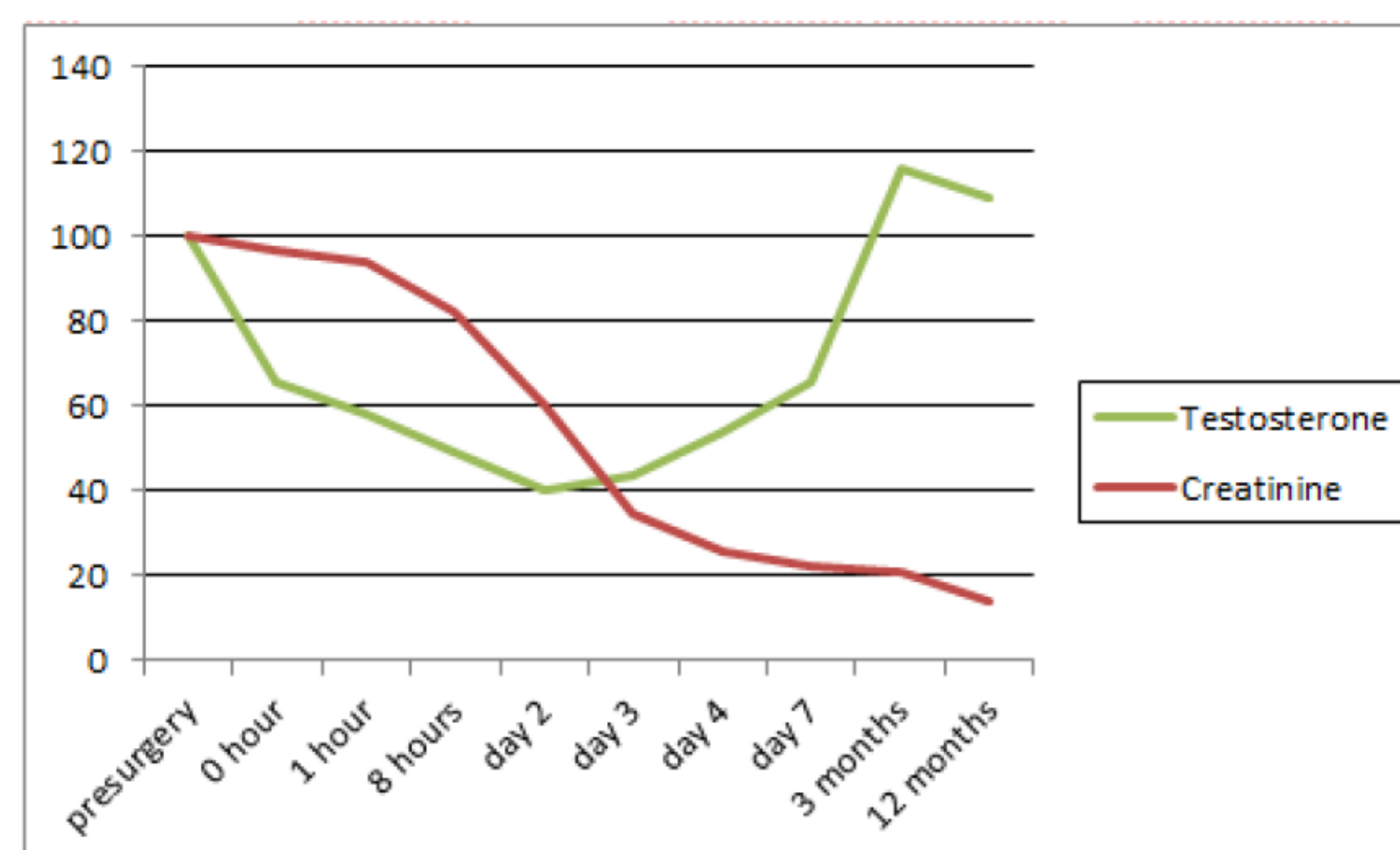


Fig 2. Median values of testosterone and creatinine calculated as percentage of pretransplant value

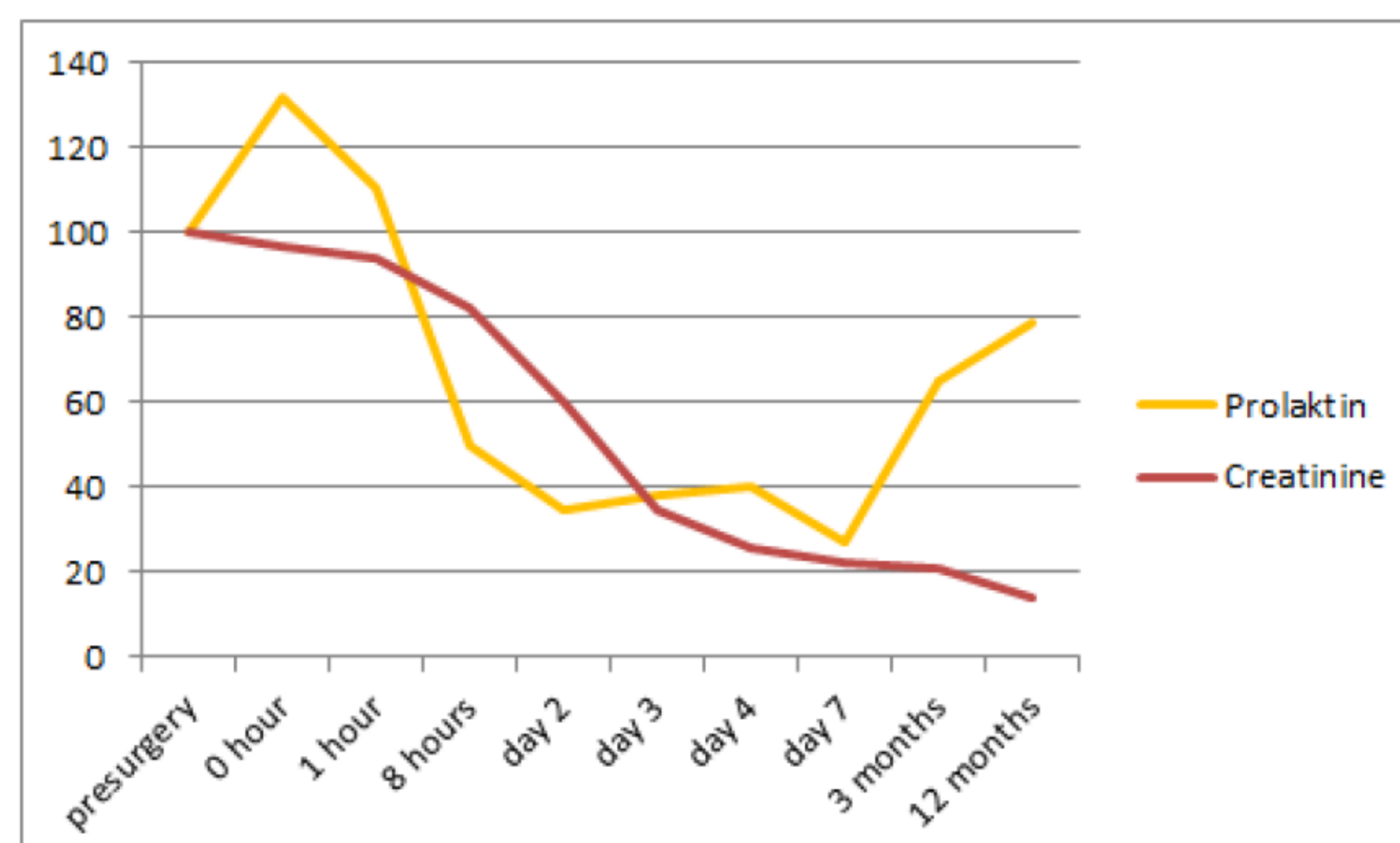


Fig 3. Median values of prolactin and creatinine calculated as percentage of pretransplant value

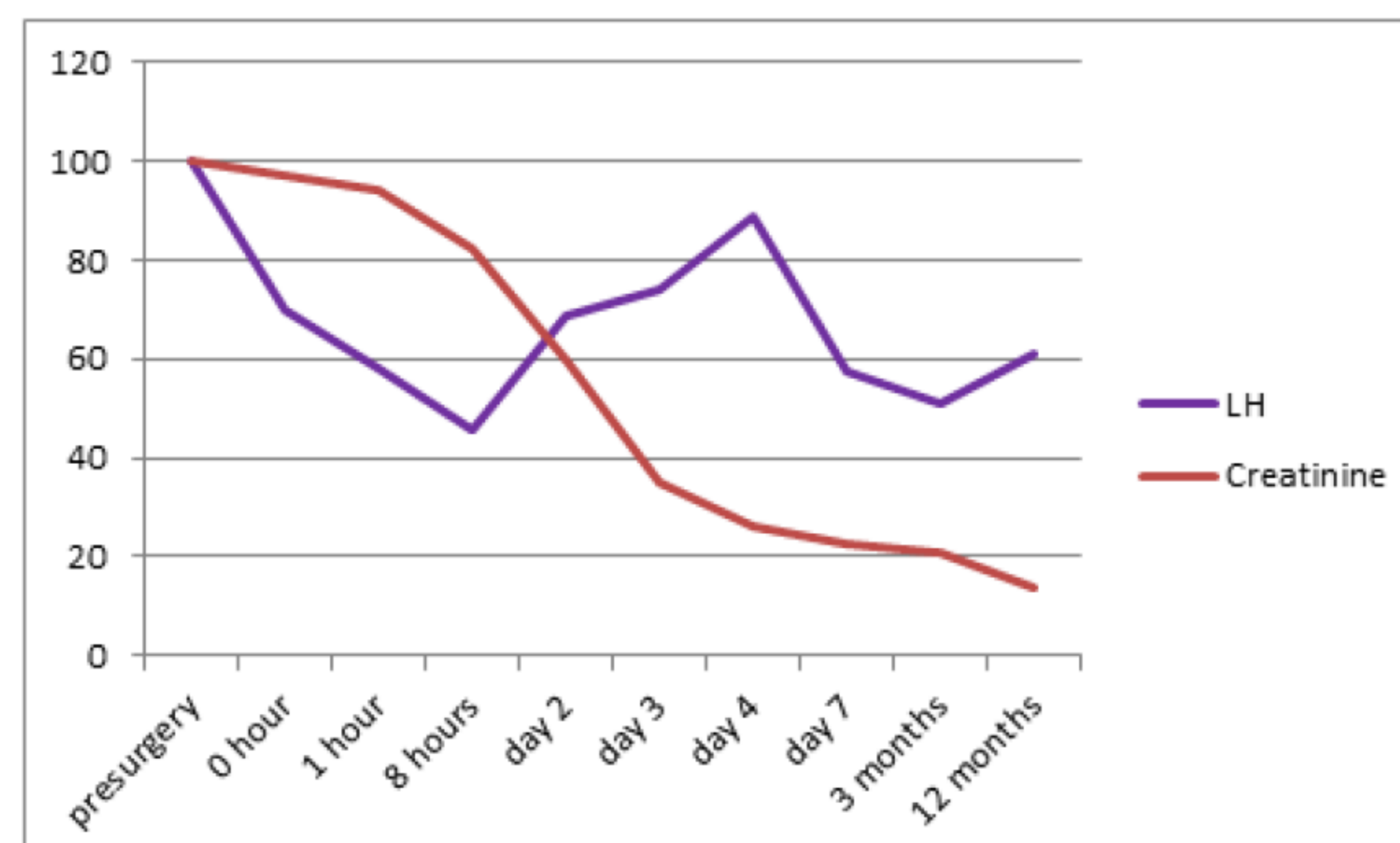


Fig 4. Median values of LH and creatinine calculated as percentage of pretransplant value

A week after transplantation a level of about 60% of the pretransplant level was established. Plasma AMH initially decreased during the first week after transplantation. Three months after transplantation the median plasma values were increased by 30% and after 12 months the median levels were increased by 40%.

Conclusion

The present study gives new insights to fertility-related hormones after kidney transplantation. Low plasma levels of AMH have earlier been described among patients with nonobstructive azoospermia. Our patients showed low plasma levels of AMH that were not increasing during the first week after transplantation. However three months after renal transplantation the median plasma levels of AMH had increased by approximately 30% and continued to increase. At 12 months the increase was 40%. The concentration of testosterone was severely reduced during the first week after surgery most likely due to the corticosteroid medication as well as the surgical stress. Plasma prolactin, a medium to large molecule of 24kDa, was rapidly decreasing after a successful renal transplantation most likely due to increased renal clearance. Thereafter, it increased to a level still below the pretransplantation level. The decreasing levels of prolactin and LH and the increasing levels of AMH and testosterone after a successful renal transplantation might reflect hormonal changes with increasing fertility. However the slow increase of AMH could reflect that it takes several months or perhaps years to restore Sertoli cell function after reestablishing kidney function and diminishing the uremic milieu.

References

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