RETROSPECTIVE EVALUATION AND FOLLOW-UP OF PATIENTS UNDERGOING VENOUS THROMBOSIS OF RENAL VEINS IN THE NEONATAL PERIOD

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INTRODUCTION

▫Neonatal period is critical to the possibility of thrombotic conditions

▫The outcome of such conditions is difficult to predict, but one of them may be a decrease in renal function in the future

AIM

▫To identified predisposing factors, clinical features of the acute period retrospectively and evaluate the kidney function in patients undergoing thrombosis of renal veins in the neonatal period

MATERIALS AND METHODS

We analyze the hystories of 12 patients with renal vein thrombosis 1-23 days of age (mean age 4.5 [1;23]) from 2011 to 2016. The visualise diagnostic method was ultrasound (US) with duplex doppler US. The state of hemostasis was evaluated by coagulation tests. We investigated polymorphisms in coagulation factor genes (MTHFR, F5, FXII, FXIII, PGT, PAI-1, FGB, ITGB3, GP1BA, MTRR) by PCR mass spectrometry, restriction digest in some patients (n = 4)

Retrospective analysis

12 patients with thrombosis of renal vein

(mean age 4,5 [1;23])

Duplex doppler ultrasound

Coagulation tests

Coagulation genes polymorphisms (n=4)

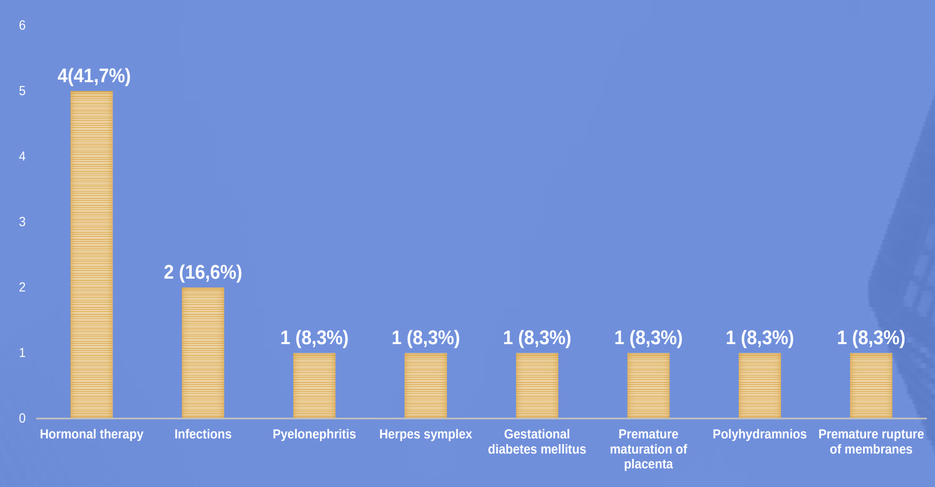
MTHFR, F5, FXII, FXIII, PGT, PAI-1, FGB, ITGB3, GP1BA, MTRR

Abbreviations: AKI – acute kidney injury; US – ultrasound; VCI – vena cava inferior; CKD – chronic kidney disease; MTHFR - methylenetetrahydrofolate reductase, F5 – factor 5, PGT - prostaglandin transporter, PAI-1 plasminogen activator inhibitor -1, FGB - fibrinogen B beta, ITGB3 - integrin alphaIIb/beta3 (αIIbβ3), GP1BA - platelet glycoprotein Ib alpha chain, MTRR - methionine synthase reductase

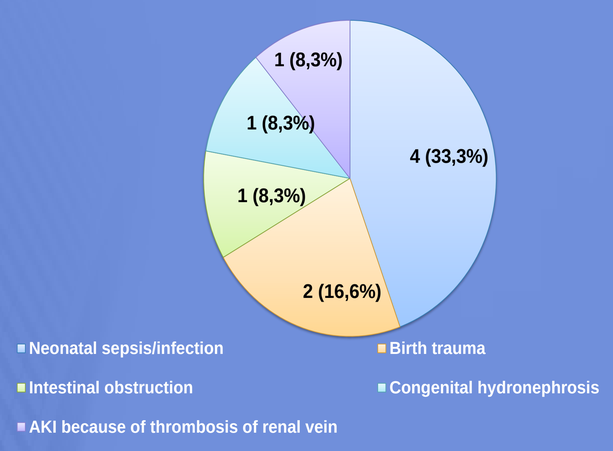
RESULTS

All patients were born in term 38-41 week ★ **Weight 3100-4650g** ★ **Equal gender distribution**

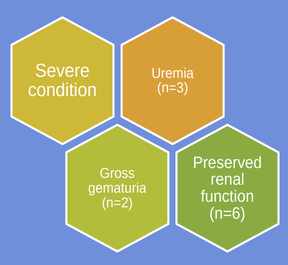
The pregnancy was complicated in all cases:



9 patients (75%) were transferred from birthing centers in the early neonatal period with diagnosis:

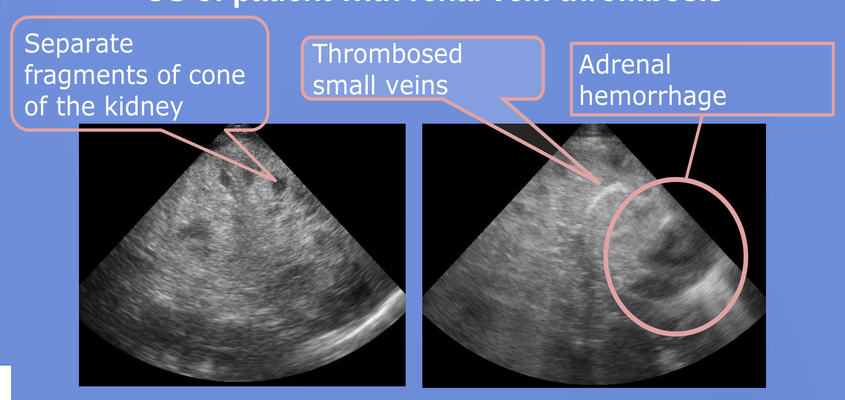


Admission status (n=9)



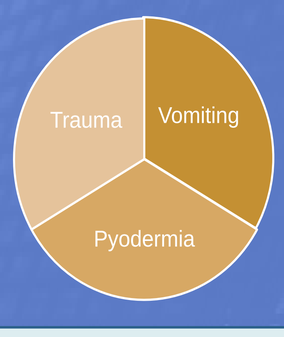
By US in 3 (25%) cases unilateral renal vein thrombosis was revealed, in 2 (16,6%) - bilateral thrombosis of the main veins, in 4 (33,3%) - bilateral thrombosis of small branches of the renal veins. In parallel, the thrombosis of the vena cava inferior (VCI) was diagnosed in 5 (41,7%) patients, hemorrhage in the adrenal glands – in 4 (33.2%), in the temporal lobe of the brain - at 1 (8.3%)

US of patient with renal vein thrombosis



Significant increase in the size of the kidneys. The structures are poorly differentiated, the contours are uneven, fuzzy. Parenchyma with uneven marked increase in echogenicity.

3 of 12 patients were hospitalized at 12-23 days of life with



US showed signs of thrombosis of the renal veins. There were not any signs of renal dysfunction were noted.

4 patients were examined after 2 months- 6 years after suffering of thrombosis

Nephrosclerosis (n=2) → CKD 1-3 stages → Decreasing of kidney's size → Hyperthrophy of contralateral kidney

In patients with two-sides thrombosis of kidneys multigenic thrombophilia was revealed: in 1 case the combination of 3 homozygous (GP1BA, PAI -1, MTRR) and 4 heterozygous polymorphic genotypes (MTGFR, ITGB3, factors XII, XIII), in other cases (n=3) were detected from 3 to 4 mutant alleles in heterozygous form in combination with defects of folate cycle enzymes.

CONCLUSIONS

- Thrombosis of renal veins in newborns may be accompanied by severe states (infections, birth trauma), or to be a manifestation of hereditary disorders of hemostasis
- Bilateral vascular lesions of the kidneys is more common
- Ultrasound is a fast and accurate method for the diagnosis of renal vein thrombosis in newborns
- Unilateral and partial thrombosis of the small vessels of the kidney may be asymptomatic, bilateral thrombosis of the main renal vein leads to the development of AKI
- The prevalence of thrombotic process, hereditary factors of pathological thrombus formation determines prognosis of renal survival

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