EO-01
Receptor-independent intracellular radical scavenging activity of angiotensin II receptor blocker
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Background: Unusual local expression of Angiotensin II in the renal interstitial cells is essentially related to pathogenic mechanisms involved in the progressive glomerulonephritis. Therefore, local blockade of Ang II action will be a critical step to halt or ameliorate the disease. Thus we used a novel approach of sub-renal capsule implantation of collagen sponge combined with ARB. Method: Type-I collagen sponge was combined with Angiotensin II, Angiotensin II + ARB (Valsartan, 100 mg) and placebo (sponge) and implanted beneath the renal capsule of the 8 weeks old Musch-Wistar rats. Urinary protein, serum chemistry, immunohistochemistry of renin, AT1, AT2 receptors renal histology, intraperitoneal B12 velocity, and mRNA expression of AT1 and AT2 receptors using real time PCR were evaluated at the 9th day after implantation. Results: At day 9 after disease induction, mild proteinuria, 207±47mg/day, was found. Local ARB treatment reduced the proteinuria significantly to 319±23mg/day (P<0.001). Sections of glomerular matrix expansion and ischemic index revealed that local ARB treatment ameliorated the glomerular pathology significantly. Glomerular expression of AT1 receptor in Ang II-treated group appeared to increase compared to the disease control group. Using Real time PCR, we found significant decrease in expression of AT1a and AT1b receptor mRNA in local ARB treatment group (P<0.001). Furthermore, local delivery of ARB was the most effective and prospective treatment for retarding the progression of glomerulonephritis.

EO-02
Function of endothelial progenitor cells (EPC) and effects of ARB on it in SHR-SP in vivo
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We evaluated effects of ARB on endothelial progenitor cells (EPC) function in hypertension in vivo. WKY/Izm rats and SHR-SP/Izm were used. Losartan (10 mg/kg, orally) or telemisartan (TCDM, 20 mg/kg, orally) was administrated for 2 weeks. We evaluated EPC migration in vitro and in vivo. To evaluate EPC function in vivo, the rats were treated with either vehicle, or losartan, or telemisartan for seven weeks. SBP, DBP, and pulse pressure were measured by ta
tibular Doppler ultrasound. EPC was isolated from blood and migrated in vitro on wounded monolayer of cultured SMCs. Chemotaxis assays of EPC were performed using Boyden chamber. Migrated EPC was stained with DAPI and examined under fluorescent microscope. We found that SHR-SP rat EPC was significantly reduced compared with WKY/Izm rat EPC. Losartan and TCDM improved EPC migration in vitro. However, the improvement was not observed in in vivo study. These results indicate that EPC function is impaired in SHR-SP rat with oxidative stress. ARB improved the impaired EPC function in hypertensive rats.

EO-03
Imaging of renal redox status during antihypertensive treatments
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Currently it is difficult to detect antioxidative effects of antihypertensive drugs on concurrent in vivo redox status. This raises a difficulty to distinguish the antioxidative effects of the drugs from its proper effects on blood pressure or hemodynamics. We have developed in vivo EPR/EPD imaging system for the purpose of non-invasive evaluation of inter-organ redox status and applied this to the measurements of antioxidative effects of calcium channel blocker azelnidipine (Azl), nifedipine (Nif) and angiotensin II receptor antagonist olmesartan (Olm) in the hypertensive animal model of two-kidney one-clip hypertension model and rapid-scanning in vivo EPR imaging for the rat model. EPD imaging revealed that Azl induce the increase in renal local reducing activity by Azl. This implies that Azl improves the renal reducing activity in vivo. However, the improvement of renal reducing activity by Azl was detected with the short dose treatment (1 mg/kg/day), which dose probe, 50.4±4.0 mg/kg/day. To evaluate antioxidative effects of hypertensive animals, we measured blood pressure and blood pressure. Selected results indicate that the antihypertensive drugs improve renal antioxidative activity independent of blood pressure controls and antioxidant activity individual-dependent of blood pressure controls. As above results indicate that antioxidative activity of EPR/EPD mouse compared to control rats, respectively. We found that the antioxidative activity of Azl, Nif and Olm decreased blood pressure in the same degree, however the renal antioxidative activities were only improved by Azl and Olm. There was no correlations between the two-kidney one-clip hypertension model and renal reducing activity by Azl and Olm. These results indicate that antioxidative activity of Azl, Nif and Olm have strong ability to ameliorate renal redox status, while the antioxidative effect of Nif is unclear.

EO-04
Local delivery of ARB into rat kidney ameliorated the progression of experimental glomerulonephritis
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Background: Unusual local expression of Angiotensin II in the renal interstitial cells is essentially related to the pathogenic mechanisms involved in the progressive glomerulonephritis. Therefore, local blockade of Ang II action will be a critical step to halt or ameliorate the disease. Thus we used a novel approach of sub-renal capsule implantation of collagen sponge combined with ARB. Method: Type-I collagen sponge was combined with Angiotensin II, Angiotensin II + ARB (Valsartan 100 mg, and placebo (sponge) and implanted beneath the renal capsule of the 8 weeks old Musch-Wistar rats. Urinary protein, serum chemistry, immunohistochemistry of renin, AT1 and AT2 receptors renal histology, intraperitoneal B12 velocity, and mRNA expression of AT1 and AT2 receptors using real time PCR were evaluated at the 9th day after implantation. Results: At day 9 after disease induction, mild proteinuria, 207±47mg/day, was found. Local ARB treatment reduced the proteinuria significantly to 319±23mg/day (P<0.001). Sections of glomerular matrix expansion and ischemic index revealed that local ARB treatment ameliorated the glomerular pathology significantly. Glomerular expression of AT1 receptor in Ang II-treated group appeared to increase compared to the disease control group. Using Real time PCR, we found significant decrease in expression of AT1a and AT1b receptor mRNA in local ARB treatment group (P<0.001). Furthermore, local delivery of ARB was the most effective and prospective treatment for retarding the progression of glomerulonephritis.

EO-05
Combination of epienopone and ACE inhibitor in the downregulation of TGF-beta and NADPH oxidase in the kidney
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Long term treatment with angiotensin converting enzyme inhibitor (ACEI) is associated with uncontrolled epienopone expression called aldosterone escape that can reverse the beneficial effect of the ACEI. In this work we assoicated the aldosterone antagonist epienopone to an ACEI and examined the effect on renal transforming growth factor (TGF)-beta expression and oxidative stress. Combined with NADPH oxidase in the Dahl salt-resistant rats with heart failure (DSRF). Control Dahl salt-resistant and DSRF rats were fed with 8% NaCl diet and at eleven weeks the DSRF rats were treated with either vehicle, or epienopone, or an dualodepacth of the combination of both drugs for seven weeks. In the DSRF rats, creatinine clearance increased compared to control and it was reduced by the ACEI and combined therapy but not by epienopone alone. In the kidney of DSRF, NADPH oxidase was increased compared to control and promoted monokallikairetic deposition. The combination of epienopone with ACEI showed the best reduction of NADPH oxidase and monokallikairetic deposition and inhibition of glomerulonecrosis. TGF-beta was increased in the kidney of DSRF rats and did not decrease with ACEI but decreased with epienopone and combined therapy to the same extent. Renal aldosterone was unchanged in the DSRF rats, but increased with administration of the ACEI and decreased with epienopone and combined therapy. In conclu
dion, ACEI leads to aldosterone escape in the kidney. The association of epienopone is beneficial due to blockade of renal aldosterone escape with further reduction of NADPH oxidase expression and inhibition of TGF-beta resulting in improvement of glomerulonecrosis and proteases.
Tissue inhibitor of metalloproteinase-1 (TIMP-1) is a promoter of renal fibrosis through inhibiting activities of matrix metalloproteinases (MMPs). Several inflammatory mediators including TGF-β, IL-1β, and IL-6 are known to induce TIMP-1 expression. However, the direct role of TIMP-1 during renal fibrosis development has not been defined. To address this issue, we established a homozygous human TIMP-1 (hTIMP-1; +/+) transgenic mouse model. At 7th day after unilateral ureteral obstruction (UUO), the number of hTIMP-1-positive cells was significantly increased compared to those of wild-type mice. The number of macrophages (ED1-positive) were found to be proliferating (PCNA-positive). A close correlation between expression of hTIMP-1 and PCNA to identify proliferating macrophages, dual staining for ED1 and hTIMP-1 was done. In obstructed kidneys the number of hTIMP-1-, ED1-, PCNA-, TGF-β1-positive cells was significantly increased compared to those of wild-type mice. Moreover, double staining for TGF-β1 and hTIMP-1 was performed. In obstructed kidneys the number of hTIMP-1-positive cells was homogenous from F4/80-positive cells. Local proliferation of macrophages has been reported to be a part of the inflammatory response in various diseases. Features of vasculitis are recapitulated by the local Shwartzman-like reaction (LSR) which is characterized in wild-type mice (+/+) by neutrophil accumulation, vascular injury and hemorrhage. Mac-1 (CD11b/CD18) deficient mice (-/-) subjected to LSR exhibited no hemorrhagic lesions despite having normal neutrophil infiltration. Moreover, lesions were restored in Mac-1+/- mice reconstituted intravenously with wild-type neutrophils but not intravenously with Mac-1+/- neutrophils. Mac-1+/+ neutrophils restored LSR in Mac-1-/- mice reconstituted intravenously with Mac-1+/+ neutrophils but not intravenously with Mac-1+/- neutrophils. We hypothesized that Mac-1/C3 interactions is required for elastase cytotoxicity. The biological target of elastase activity, however, has not been identified. Therefore, we established a heterozygous human TIMP-1 (hTIMP-1; +/+) transgenic mouse model. Overexpression of TIMP-1 could promote fibrin deposition and here we show that P-selectin is a target of NE activity in vitro. Elastase activity is not clear. Previously, P-selectin was shown to be protective in LSR by promoting neutrophil extravasation. We studied in vivo role of Mac-1 dependent elastase activity, and P-selectin, in inflammation-induced vascular injury.
Role of ivermectin in patients of chronic renal failure with scabies

Alok Kumar, Raj Kumar Sharma, Sanjeev Gulati, Narayan Prasad, Amit Gupta

Study was performed to evaluate efficacy and safety of ivermectin in patients of chronic renal failure with scabies. 24 patients of chronic renal failure with scabies were treated with ivermectin in last 18 months. They were treated with ivermectin 0.2mg/kg single dose. Second dose was administered after 2 weeks if they did not respond. Patients were diagnosed clinically. If they had atypical features, scrapings of skin was taken. Mean age of patients was 38±2.2 years. Sex ratio was 14 (M: F). Patients had mean creatinine of 2.25±1.4mg/dl. 22 of 24 patients responded to treatment (91.6%). 2 patients those did not respond to 2 doses, they responded after addition of 0.5% permethrin. Five patients required 2 doses of ivermectin (20.8%). 2 patients with crusted scabies needed 3 courses of treatment. No adverse event in form of EF control, worsening of anemia, rashes, neurotoxicity was noted. Ivermectin appears promising drug in patients of chronic renal failure. Although 20% patients may need more than 1 course.

Metabolic Syndrome as an independent risk factor in nondiabetic patients with CKD at stage 3: A nested cohort study from the COOPERATE trial

Naoyuki Nakao1, Akira Fujimori1, Makoto Sakai1, Masafumi Fukagawa2

Metabolic syndrome (MS), defined as a pathological state of clustering of several metabolic aberrations, may play a role in establishment of organ damage in general population, including non-diabetic CKD (JASN 20: 1234, 2009). It is not clear whether MS is an independent risk factor for progression of non-diabetic CKD at stage 3. Therefore, we have conducted a post-hoc nested cohort study from the COOPERATE Database Registry. The COOPERATE trial is a clinical trial aiming a superiority of dual blockade of renin-angiotensin system (RAS) over each monotherapy in renoprotection. (Lancet 361: 117, 2003). Enrolled patients were divided into two groups according to presence or absence of MS (Japane Society of Internal Medicine). At randomization, compared with patients without MS (MS-), patients with MS (MS+) had increased abdominal fat area and lipid and glucose abnormality, while in blood pressure and renal function they did not show any differences. Survival curve (a primary end-point of a doubling of serum creatinine value or end-stage renal disease) clearly demonstrated an advantage in survivors in both groups as compared to nonsurvivors. Albumin at baseline was significantly higher in survivors than non survivors in both groups (2.23±0.83g/dl vs 2.24±0.94 in CVVHDF & 2.28±0.96g/dl vs 2.31±0.62 in IPD group) Patients in IPD group were sicker with lower mean arterial pressure (MAP) requiring inotropic support, (73.8% in IPD vs 58.4% in CVVHD group). In conclusion IPD offers comparable Survival advantages in critically ill patients with renal failure in ICU settings with lowcost

Effects of L-carnitine on inflammation in chronic hemodialysis patients

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Dong Zhang, Lijun Shen, Xiangmei Chen, Jianhui Zhou, Ribao Wei

Objective To evaluate the effects of L-carnitine treatment on inflammatory pathology in maintenance hemodialysis (MHD) patients. Methods This study included 50 MHD patients who were followed-up for more than 3 months in our dialysis center. On the basis of the level of serum high sensitive C-reactive protein (hs-CRP), malondialdehyde (MDA), C-reactive protein (CRP), and subclinical atherosclerosis, patients were divided into L-CN group (10 mg L-carnitine intravenous injection, 2 week) and control group. We evaluated hs-CRP, serum albumin (Alb), hemoglobin (Hb), prealbumin, transferrin, triglyceride and nPCR at baseline, after 6 and 12 months. Results The L-CN group showed a statistically significant decrease in hs-CRP and increase in serum albumin and transferrin, blood hemoglobin, and body mass index. On the contrast, in the control group, no significant changes were found in serum albumin, serum transferrin, and body mass index whereas the other measures did not change significantly. Conclusions These preliminary findings suggest that in MHD patients, L-carnitine therapy may suppress inflammation, particularly among those patients with hs-CRP>3mg/L. Key words high sensitive C-reactive protein, maintenance hemodialysis, L-carnitine

Study of Hypothalamic Pituitary Adrenal Axis in Patients of Membranous Nephropathy Receiving Modified Ponticelli Regimen

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Cancellous bone microstructure is a factor that largely affects bone quality. Uremia induces various metabolic abnormalities in bone. Nevertheless, little was known about the relationship between bone metabolism and bone microstructural properties. Patients undergoing chronic dialysis therapy were enrolled in the study. Ilaic bone biopsy was performed and the tomographic images were generated from bone samples by a micro-CT. 16 non-dialyzing and 12 chronic hemodialysis (CHD) patients were selected for the analyses. Both three-dimensional Neutron Diffraction and macro FK-3D model. The results were compared with the data obtained by a conventional two-dimensional bone histomorphometry. In results, 20 patients (5 with osteitis fibrosa = OF, 6 with mild change = MC, 9 with adynamic bone = AB) were subjected for the analyses in both groups. Three-dimensional Neutron Diffraction and macro FK-3D model. In conclusion, cancellous bone microstructural changes was observed in OF than MC, while that in MC and AB were comparable. In conclusion, cancellous bone microstructural changes was observed in OF than MC, while that in MC and AB were comparable. Three-dimensional morpho-metric analysis applying a 3-point method to evaluate microstructural properties in urmeric bones.
**EO-19**

**Renal interstitial inflammation is a risk factor for progression of IgA nephropathy with chronic renal failure**

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Objective To study clinical significance of renal interstitial inflammation in patients of IgA nephropathy (IgAN) with chronic renal failure. Methods and pathologic finding were reviewed in 255 patients of IgAN with chronic renal failure who were reviewed in our department. Semiquantity score system was used to evaluated renal pathologic changes. All patients were divided into three groups according to their estimated glomerular filtration rate (eGFR) A group A (eGFR >= 90 ml/min/1.73 m^2), group B (15 ml/min/1.73 m^2 < eGFR < 30 ml/min/1.73 m^2) and group C (eGFR < 15 ml/min/1.73 m^2). The Clinical and pathologic difference among three groups were detected. Results factors affecting GFR were analyzed using step by step mutiple variance regression analysis. Results The interstitial inflammation scores in group A were lower than other two groups (P<0.001). GFR in group B had correlations with interstitial inflammation scores. Interstitial inflammation, male hypertensive, proteinuria, and vessel lesions were risk factors affecting GFR (P<0.05). Conclusions Renal interstitial inflammation is a risk factor for progression of IgA nephropathy with chronic renal failure. Antifibrotic treatment is still important to patients of IgAN with serious renal dysfunction.

**EO-20**

**Prognostic Significance of Renal Histopathology in Patients with Thrombotic Microangiopathy**

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Mannoj Jain1, Archana Rastogi1, Sanjeev Gulari1, Tanu Agarwal1, Ramesh Kumar Gupta1

Thrombotic Microangiopathy (TMA) is a clinicopathological entity with varied etiology and is characterized histologically by microvascular occlusive morphology. This study was conducted to analyse the clinical profile and prognostic significance of native renal biopsy in patients with TMA.

The retrospective analysis included 100 native renal biopsies received over a period of 2 years at a tertiary care centre of India. Of these, 30 patients had histological evidence of TMA. We studied clinical profile and various laboratory parameters. Biopsies were evaluated for the presence of glomerular, vascular or non-vascular lesions.

The results showed that patients with TMA were predominantly female (68%) and had a median age of 26.8 years (range 8-68 yrs) and M : F ratio was 4 : 1. The most common histological pattern was mesangial with segmental thickening (38%), followed by segmental glomerulosclerosis with global thickening (23%), mixed pattern (12%) and cortical necrosis (2%).

**EO-22**

**Eicosapentaenoic acid attenuates the progression of type 2 diabetic nephropathy in KK/AY mice through inhibition of oxidative stress**

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**Background**: Eicosapentaenoic acid (EPA) has been reported to have beneficial effects on many chronic diseases including diabetic nephropathy, but the precise mechanisms are not completely understood. Oxidative stress plays an important role in the progression of diabetic nephropathy. We examined whether EPA can inhibit oxidative stress and the subsequent glomerulosclerosis in KK/Ay mice. Methods: KK/Ay mice were divided into two groups. The treatment group was injected with EPA ester injected at 1 mg/kg intraperitoneally from 12 to 20 weeks of age and the control group was injected with saline.

The histopathological damage was quantified by morphometric analysis. Renal expression of nitrotyrosine, malondialdehyde, TGFβ-1 and collagen I was evaluated by immunohistochemistry while the gene expression of TGFβ-1 and collagen I was measured by real-time RT-PCR. Results: EPA decreased the levels of serum streptozotocin and urinary albumin and improved glucose intolerance in KK/Ay mice. Morphometric analysis showed that accumulation of extracellular matrix and the tubulointerstitial fibrosis area were clearly decreased after treatment. In immunohistochemistry, increased expression of nitrotyrosine and malondialdehyde was found in the glomeruli and immunostaining of TGFβ-1 and collagen I was decreased in the treatment group. Conclusions: EPA attenuates the progression of diabetic nephropathy in KK/Ay mice and this beneficial effect might be at least partly due to inhibition of oxidative stress.

**EO-21**

**Factors predictive of remission in steroid resistant nephrotic syndrome in children**

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Thrombotic Microangiopathy (TMA) is a clinicopathological entity with varied etiology and is characterized histologically by microvascular occlusive morphology. This study was conducted to identify factors predictive of remission in response to immunosuppressive therapy in patients with TMA.

We retrospectively analyzed 1500 native renal biopsies received over a period of 2.5 years at a tertiary care centre of India. Of these, 35 patients had histological evidence of TMA. We studied the clinical profile and various laboratory parameters. Biopsies were evaluated for the presence of glomerular, vascular or non-vascular lesions.

The results showed that patients with TMA were predominantly female (68%) and had a median age of 26.8 years (range 8-68 yrs) and M : F ratio was 4 : 1. The etiological breakup was D+HUS (5), D-HUS (15), TMA (13), mixed pattern (12) and cortical necrosis (2).

**EO-23**

**Evaluation of Role of Low Molecular Weight Heparin Vitamin E on Renal Functions and Oxidative Stress in Patients of Diabetic Nephropathy**

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Twenty-five clinically proven adult cases of diabetic nephropathy (DN) stage II III were studied. At the start of the study, patients were put on low molecular weight heparins (in the form of Enoxaparin Sodium 12500U s.c. once daily for a period of one month). Thereafter a washout period of one month was given, following which patients were put on oral antioxidant therapy (Vitamin E 200mg daily once for three months). Various biochemical renal parameters, urinary albumin, glycosylated hemoglobin, markers of oxidative stress, i.e. reduced glutathione (GSH) and malondialdehyde (MDA) were estimated at the beginning (baseline) after one month of heparin treatment, then every three months. The decrease induced by one month treatment with LMWH treatment for one month and this decrease persisted after one month of washout period. Vitamin E treatment for three months did not bring any statistically significant changes in the values of malondialdehyde (p<0.05). The decrease induced by one month treatment with LMWH treatment for one month led to a decrease in glycosylated hemoglobin (HbA1c) from 6.82±0.41 to 6.29±0.41 (p<0.001) after one month of LMWH treatment and this decrease persisted after one month of washout period. Vitamin E treatment for three months did not bring any statistically significant changes in the values of malondialdehyde (p<0.05). The decrease induced by one month treatment with LMWH treatment for one month led to a decrease in glycosylated hemoglobin (HbA1c) from 6.82±0.41 to 6.29±0.41 (p<0.001). The decrease induced by one month treatment with LMWH treatment for one month led to a decrease in glycosylated hemoglobin (HbA1c) from 6.82±0.41 to 6.29±0.41 (p<0.001). Vitamin E treatment decreased HbA1c levels further (p<0.001). LMWH treatment did not affect GSH levels but Vitamin E supplementation increased GSH level significantly. MDA level also remained unaffected by LMWH whereas Vitamin E decreased MDA level significantly. LMWH treatment needs to be considered in the asymptotic stage of DN/ESN which could be followed by low cost vitamin E treatment for delaying the progression of DN.

**EO-24**

**Pathogenesis of “capsular dropout” in the renal corpuscle of diabetic nephropathy**

Tokyo Kidney Research Institute

Nobuaki Tannaka

In renal corpuscles of diabetic nephropathy, we sometimes recognize the appearance of small areas of the empty spaces in Bowman’s capsule (BC). These areas were thought to be the result from isolation of serum components into the BC. In this study, it was investigated that the empty spaces in BC were not isolated, but the result from immune-adhesion to the glomerular tuft in a certain dimension of the specimen. The thickening between glomerular lesions and CDs. The cases with the CD lesion frequently showed thickening of BC. In usual two-dimensional observation of BC was thought to be the result from insulation of serum components into the BC. In usual two-dimensional observation of BC was thought to be the result from insulation of serum components into the BC.
Renal cortical scarring and primary vesicoureteral reflux in Thai children

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Objective: To evaluate the association between primary vesicoureteral reflux (VUR) and renal scarring in children. Patients and methods: Children with primary VUR attending at Songklanagarind Hospital were evaluated for presence of renal scarring using technetium-99m labeled dimercaptosuccinic acid (DMSA). Results: There were ninety-eight children. Ages at diagnosis of VUR in 46 boys and 52 girls were 1.1 to 16.9 and 2.5 to 23 years, respectively (p<0.001). DMSA scans were performed at 3.1 to 6.3 years. Renal parenchymal damage was detected in 34 kidneys (36%) of 53 demonstrated refluxing ureters, and one kidney (2%) of 50 non-refluxing ureters (p=0.006). Of 79 refluxing ureters in boys and 70 refluxing ureters in girls, there were 25 and 9 renal scars respectively (32% and 12%, p=0.003). Renal scars were related to VUR grade, with the severe grades tending to have a higher rate of renal damage (grades IV-V were 11, 12, 44, and 62% respectively, p<0.001). Multivariate analysis revealed that high grade VUR (p<0.001), age of diagnosis of VUR greater than 5 years (p=0.001), and male gender (p=0.002) were the most significant risk factors for renal scarring. Conclusion: Renal scars were found in 22% of primary VUR cases following UTI evaluation. High grade VUR, age of diagnosis of VUR greater than 5 years and male gender were the most significant risk factors for renal scarring.

Interacting Molecule of angiotensin II type 1 (AT1) Receptor, ATRAP, is Co-localized with AT1 Receptor in the Mouse Renal Tubules

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Background: The renin-angiotensin system in the kidney plays a critical role in the regulation of renal hemodynamics and sodium handling through the activation of vasoconstriction, glomerulonephritis, and tubular angiotensin II type 1 (AT1) receptor-mediated signaling. We previously cloned a molecule that specifically bound to the AT1 receptor and modulated AT1 receptor signaling in vena cava, which we named ATRAP (for AT1-receptor-associated protein). The purpose of the study is to analyze the renal distribution of ATRAP and to examine whether ATRAP is co-expressed with the AT1 receptor in the mouse kidney. Methods: We performed in situ hybridization, Western blot analysis, and immunohistochemistry to investigate the expression of ATRAP mRNA and protein in the mouse kidney. Results: The results of Western blot analysis revealed the ATRAP protein to be abundantly expressed in the kidney. Employing in situ hybridization and immunohistochemistry, we found that both ATRAP mRNA and the proteins were widely distributed along the renal tubules from Bowman’s capsule to the inner medullary collecting ducts. ATRAP mRNA was also detected in the glomerular, vascular, and interstitial cells. In all tubular cells, the ATRAP protein co-localized with the AT1 receptor. Finally, we found that the dosy salt depletion significantly decreased the renal expression of ATRAP as well as AT1 receptor. Conclusions: These findings show ATRAP to be abundantly and broadly distributed in renal segments when the AT1 receptor is expressed. Furthermore, this is the first report demonstrating a substantial co-localization of ATRAP and AT1 receptor in vivo.
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