The Uni-Nephrectomized SDT Fatty Rat, a novel Type 2 diabetic model of Diabetic Nephropathy, develops features of diabetic retinopathy over 10 weeks.

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**PURPOSE:**

Animal models of spontaneous diabetes are still needed to mimic human diabetic retinopathy. We recently developed a novel model of diabetic nephropathy using the uni-nephrectomized Spontaneously Diabetic Torii (SDT) fatty rat. Fed a salt/rich diet, this hypertensive/obese/type 2 diabetic rat develops advanced renal glomerulosclerosis, inflammation and fibrosis, and a >50% glomerular filtration rate decline within 10 weeks. Here we investigated whether this rat model would also develop features of diabetic retinopathy.

**METHODS:**

Two groups of 6-week old, male, Sprague Dawley (SD, control) rats and SDT fatty rats (n=10 per group) underwent unilateral nephrectomy. After a 1-week recovery period, rats were fed for 10 weeks a chow diet with 0.3% salt in drinking water (i.e. from 7 weeks to 17 weeks of age). Diabetic retinopathy was evaluated in terms of: i) retinal function by electroretinogram and oscillatory potentials, ii) integrity of blood-retinal barrier by albumin-Evans blue complex leakage, iii) microscopy histopathologic studies by glial fibrillary acidic protein (GFAP).

**RESULTS:**

SDT fatty rats under 0.3% salt exhibit obese and diabetic phenotype after unilateral nephrectomy.

Unx SDT fatty rats show reactive glia in retina at 17 weeks of age.

Evans blue retinal flat-mount indicates vessel dilatation and tortuosity, without evidence of retinal vascular permeability, in 17-week old Unx SDT fatty rat.

17-week old Unx SDT fatty rats show advanced kidney complications and a >50% glomerular filtration rate decline.

**CONCLUSION:**

- Uni-nephrectomized SDT fatty rats develop features of diabetic retinopathy in parallel with diabetic nephropathy.
- Our original data set suggests that this rat model is suitable to evaluate the effects of drugs on these type 2 diabetes co-morbidities.