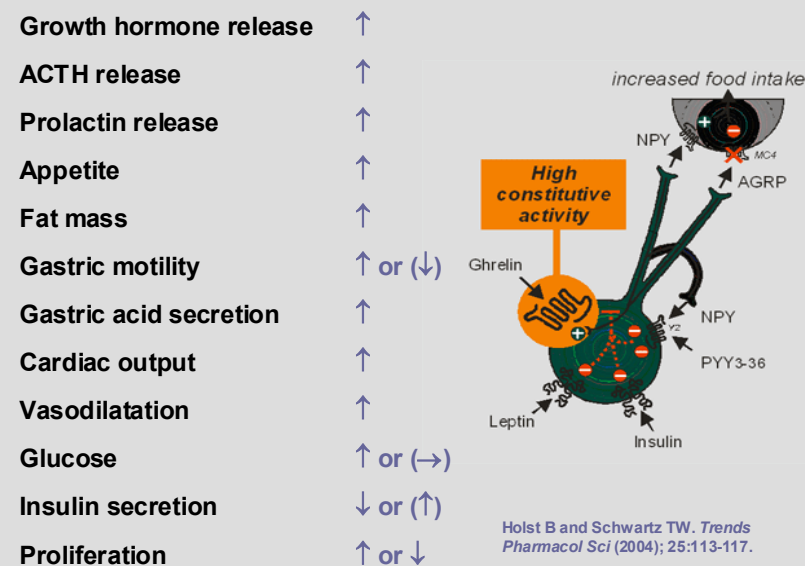


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## Background

- Poor appetite, low calorie intake and growth retardation in children with end stage renal disease (ESRD) may be regulated as a strong protection mechanism to survive renal insufficiency.
- The newly discovered neuroendocrine hormone ghrelin ("ghre"= growth, GH- releasing peptide) has been described to be a major regulator of appetite by enhancing energy balance, food intake and fat mass deposition by stimulating expression of neuropeptide Y (NPY) and agouti-related peptide (AGRP) in the hypothalamic nuclei.

Figure 1: Ghrelin: Biological activity



## Aim

- Investigation of the unknown regulation of total and active ghrelin in uremic children before and under dialysis treatment and following renal transplantation.

## Characteristics of patients and controls

	n	age (years)	BMI	GFR (ml/min/1.73m <sup>2</sup> )
Controls	11	9.6 ± 5.5	17.9 ± 6.0	97.4 ± 6.2
ESRD	25	8.9 ± 6.6	16.3 ± 2.3	14.8 ± 6.5
CAPD	11	10.2 ± 3.7	16.7 ± 3.9	13.7 ± 5.0
HD	8	13.8 ± 0.8	17.5 ± 2.5	14.2 ± 5.7
RTx	64	12.7 ± 4.9	19.8 ± 4.3	64.2 ± 23.4

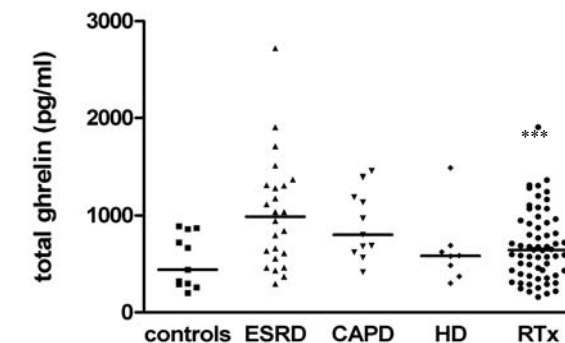
## Results

- No difference regarding sex and age, but RTx patients showed a significantly higher SDS BMI (ESRD  $-0.78 \pm 1.02$  vs. dialysis  $-0.66 \pm 1.47$  vs. RTx  $0.31 \pm 1.28$ ;  $p=0.006$ ).
- Increased total ghrelin in ESRD patients ( $1023 \pm 116$  pg/ml), when compared to children following RTx ( $689 \pm 46$  pg/ml;  $p=0.002$ , Figure 2).
- Distribution pattern of active ghrelin is highly variable among the groups (Figure 3).
- No correlation between SDS BMI and plasma level of total and active ghrelin in all groups.
- In the RTx group patients with normal glomerular filtration rate ( $>80$  ml/min/1.73m<sup>2</sup>) showed significantly higher plasma levels of active ghrelin ( $p=0.008$ , Figure 4).

## Conclusions

- This study is the first description of active and total plasma ghrelin in pediatric ESRD and RTx children.
- We observed lower plasma levels of active ghrelin in uremic children in contrast to elevated levels of total ghrelin which correlates with poor appetite.
- However, the distribution range suggests the influence of additional factors such as underlying disorders, medication or mode of dialysis and others.

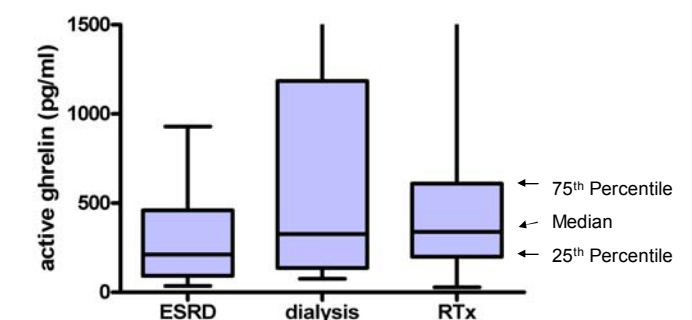
Figure 2: Total ghrelin in healthy controls, ESRD and dialysed patients (CAPD+HD) and in patients following RTx



\*\*\*  $p = 0.002$  when compared to ESRD

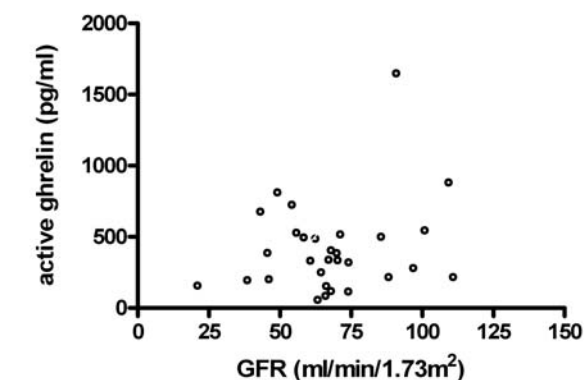
Total ghrelin kit obtained from Phoenix Pharmaceuticals, Inc., Belmont, CA, USA

Figure 3: Active ghrelin in ESRD, dialysed and RTx patients



Active ghrelin kit obtained from Linco Research, Inc., St. Charles, MO, USA

Figure 4: Active ghrelin in correlation to GFR in RTx patients



$p = 0.008$