Raw feeding and suspected early chronic kidney disease in a dog - a case report

Residency class 2016, Berlin

Britta Kiefer-Hecker

Supervisor: Britta Dobenecker, LMU Munich, Germany

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„Max“

History (attending veterinarian)

- German shepherd mix
- Male
- 10 years old
- 53kg bodyweight, BCS 4-5/9, ideal body weight 50kg

Suspected diagnosis (Senior blood check, Dec 2015)

- Early chronic kidney disease (CKD)

➢ *Owner wants to continue to feed his dog a raw diet*

Blood chemistry I “Max”

Serum parameter	Reference values	Dec 2015	
Crea mg/dl	<1.4	**1.5**	↑
Urea mg/dl	9-29	**30**	↑
SDMA (IDEXX)	0-14	**16**	↑
P mmol/l	0.9-1.7	*1.7*	
K mmol/l	3.9-5.8	5.2	
Na mmol/l	142-153	148	
Missing information: 1. of urine quality: Specific gravity, proteinuria?, protein-creatinine-ratio 2.bood pressure * Under 300mg/dl in dogs with ideal weight			

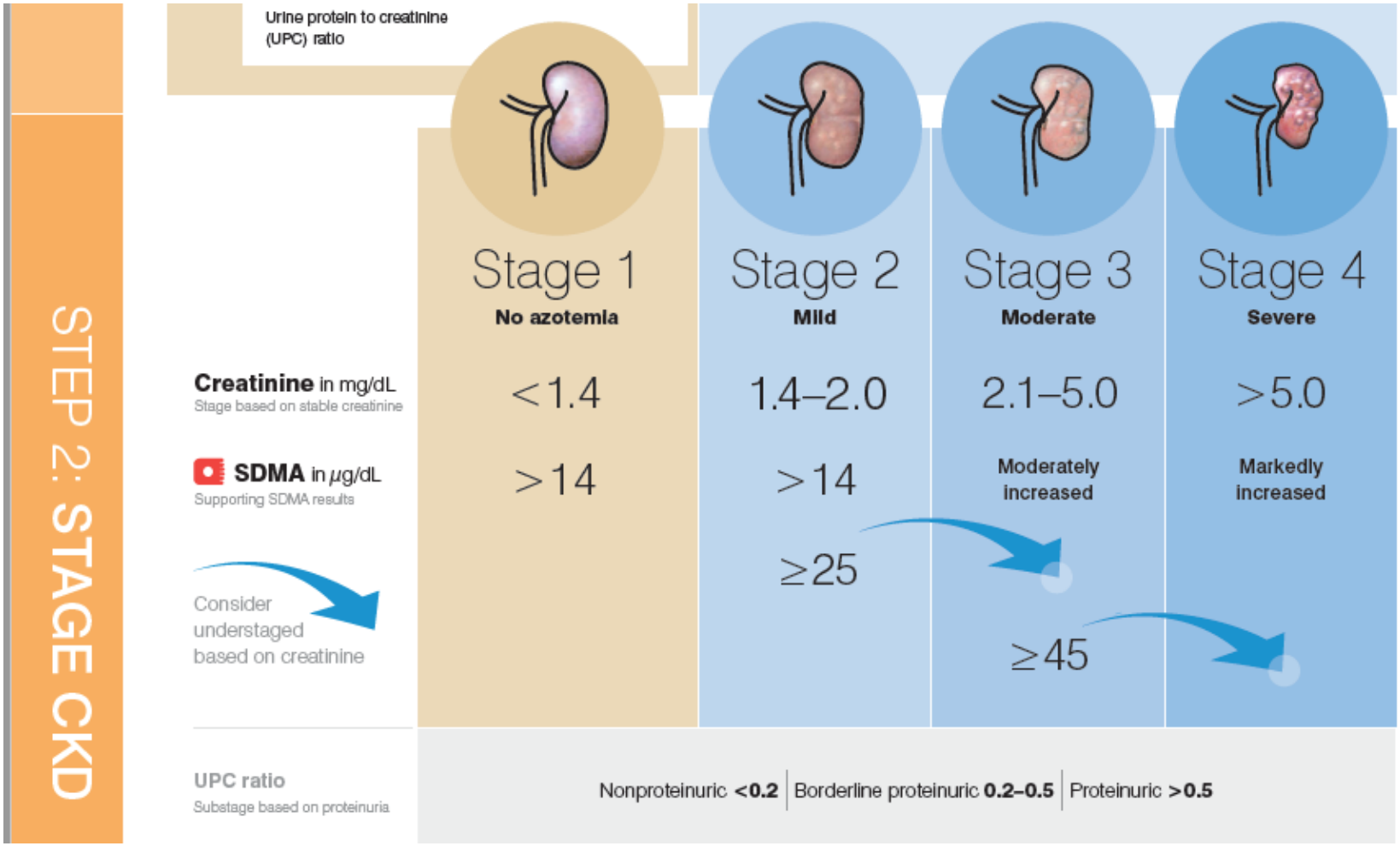
SDMA = Symmetric dimethylarginine

- SDMA = methylated form of the amino acid arginine
  - released into the circulation during protein degradation
  - excreted almost exclusively by kidneys and highly correlated with GFR
  - Increase from ~ 40% loss of kidney function in dogs* (crea is normal until 75% loss of kidney function)
  - high specificity: not impacted by extra-renal factors (crea is correlated to LBM; geriatric/cachectic animals)

➢ New biomarker for early detection in CKD (together with crea, BUN and urinalysis)

** Guess S. Longitudinal evaluation of serum SDMA and Crea in dogs with early CKD, AVCIM 2016 abstract*

Staging CRF: IRIS & SMDA



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Cholesterol* mg/dl	0 - 398	405	↑

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* Under 300mg/dl in dogs with ideal weight

IRIS Stage 1 (substaging)

Raw Feeding

- 5-10% of owners in Germany feed their dogs with raw diets; increasing trend*
- BARF = Bone and Raw Feeding: Ian Billinghurst, Australia 1993 “Give your dog a bone”
- Typical Raw diet **: 70-80% raw meat, offal/innards & bones, 20-30% fruit & vegetables, often supplemented with: vegetable oil, fish oil, algae powder, herbs etc.
  - Frequently imbalances of nutrients esp. regarding Ca content, Ca:P ratio and trace elements***
  - Inappropriate for dogs suffering from kidney disease

** Becker N. et al. Proc.16th ESVCN 2012 Demography of dog owners & rationale for BARF,*** Handl S. et al. *Proc.16th ESVCN 2012 Nutritional adequacy of BARF recipes,*** Dillitzer N. et al. Br J Nutr ;106 Suppl1:S53-60*

Actual feeding of Max (Dec)
(calculated with Diet Check Munich©)

*for adult healthy dog 50kg	Amount (g/d)	ME (MJ)	Cp (g)	Ca (mg)	P (mg)	K (mg)	Na (mg)
Recommendation*		7.1	107	2556	1917	2556	511
Content		7.0	176	1849	2863	1787	905
Raw beef (and chicken)**	600	0.6	107	969	1335	1580	465
Rice, cooked	20	3	0	0.4	8	7	0.4
Pigs ear, dried	80	4	69	880	1520	200	440

Key factors	
Cp/ME (g/MJ)	23
Ca/P	0.6
CHO %DM	4
Cfi %DM	0.3
Fat %DM	39
P/ME (mg/MJ)	403
Na/ME (mg/MJ)	127
MJ/DM (MJ/100gDM)	2.3

**Raw beef: lunge, gullet, rumen, musculus masseter, goulash, and chicken breast (in equal shares)

Dietary recommendations for dogs with CKD

- Restricted levels of P and Na (in consideration of current blood values)
  - Reduce dietary phosphorus intake by 50% by cooking sliced meat in a pressure cooker in soft water for 30min (discarb the water) *
- Protein quality ↑praecaecal digestibility
- Protein ↓ according to BUN (vs. proteinuria)
- Consequence: fat and carbs↑
- K according to blood values
- B vitamins ↑
- Optional: soluble fiber (e.g. pectin)
- Prevent loss of lean body mass – high palatability, ↑ energy density, ensure protein requirements are met, feeding several small portions, encourage eating adequate amounts

* Sakiko A et al. The Effect of Various Boiling Conditions on Reduction of Phosphorus and Protein in Meat Journal of Renal Nutrition, Vol 25, No 6 (November), 2015: pp 504-509

Recommended BARF diet for Max

*CRF, dog 50 kg	Amount (g/d)	ME (MJ)	Cp (g)	Fat (g)	Ca (mg)	P (mg)	K (mg)	Na (mg)
Recommendation*		7.1	61		2444	1466	2444	489
Content		7.1	97	105	2621	1699	3769	699
Mixed beef	300	2.4	49	57	20	322	610	263
Linseed	10	0.2	2	3	25	48	71	8
Carotts	250	0.3	2	0	93	88	803	53
Canola oil	40	1.3	0	35	0	0	0	0
Potatoes, cooked	400	1.4	9	0	45	270	2340	5
Salmon oil capsules	3	0.1	0	2	0	0	0	0
Curd (40% Fat/DM)	250	1.6	28	29	238	468	205	85
Vit min mix renal	8	0	0	0	2080	400	0	184

Key factors		
Cp/ME (g/MJ)	13.7	↓
Ca/P	1.5	↑
CHO %DM	29	↑
Cfi %DM	4	↑
Fat/DM	32	↓
P/ME (mg/MJ)	239	↓
Na/ME (mg/MJ)	98	↓
MJ/DM (MJ/100gDM)	2.1	↓

*chronic renal failure: Cp reco= 60% and P reco = 80% of healthy dog

Plus pectin (0.5-1 g/kg BW/day, start with low dosis)

Phosphate binder not necessary

Blood chemistry II “Max”

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SDMA (IDEXX)	0-14	**16**	**20**
P mmol/l	0.9-1.7	1.7	1.6
K mmol/l	3.9-5.8	5.2	5.2
Na mmol/l	142-153	148	

Missing information of urine quality: Specific gravity, proteinuria?, protein-creatinine-ration

* Under 300mg/dl in dogs with ideal weight, ** lost weight (53-> 50kg ->47.5kg***)

Blood chemistry II “Max”

Serum parameter	Reference values	Dec 2015	Feb 2016	June 2016**
Crea mg/dl	<1.4	**1.5**	1.3	1.2
Urea mg/dl	9-29	**30**	**31**	19
SDMA (IDEXX)	0-14	**16**	**20**	14
P mmol/l	0.9-1.7	1.7	1.6	1.4
K mmol/l	3.9-5.8	5.2	5.2	5.5
Na mmol/l	142-153	148		146

Missing information of urine quality: Specific gravity, proteinuria?, protein-creatinine-ration

* Under 300mg/dl in dogs with ideal weight, ** lost weight (53-> 50kg ->47.5kg***)

Blood chemistry II “Max”

Serum parameter	Reference values	Dec 2015	Feb 2016	June 2016**	Sept 2016***
Crea mg/dl	<1.4	**1.5**	1.3	1.2	1.0
Urea mg/dl	9-29	**30**	**31**	19	23
SDMA (IDEXX)	0-14	**16**	**20**	14	12
P mmol/l	0.9-1.7	1.7	1.6	1.4	1.5
K mmol/l	3.9-5.8	5.2	5.2	5.5	4.8
Na mmol/l	142-153	148		146	148

Missing information of urine quality: Specific gravity, proteinuria?, protein-creatinine-ration

* Under 300mg/dl in dogs with ideal weight, ** lost weight (53-> 50kg ->47.5kg***)

Considerations

- Reduction in lean body mass can lower serum Crea
  - pet owner did reduced the amount of food to reduce dog's weight
    - But this should not reduce SDMA**
- Dogs with CKD IRIS stage 1 consuming a renal diet (red. protein and P) showed a significant decrease in serum Crea, BUN, SDMA and USG from baseline at 3 month later and remained decreased at 12 month later*

* Hall J. et al. Relationship between lean body mass and serum renal biomarker in healthy dogs, JVIM 2015;29(3):808-14
** Hall J. et al. Positive impact of nutritional interventions in client-owned dogs with IRIS stage 1 CKD, ACVIM 2016 abstract

Conclusion

Adaptation of a BARF diet of a dog with suspected early CRF

- Further improvement of the renal parameters
  - Wrong suspicion before?
  - Improvement caused by dietary changes?