Bioactive collagen peptides as supplement for horses with osteoarthritis

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Introduction:

Osteoarthritis (OA) is a degenerative joint disease characterised by progressive destruction of cartilage and bone with a high prevalence in horses. It causes pain, lameness and functional disability and is therefore economically important. Existing treatment options are limited and often base on pain reduction. Research on bioactive collagen peptides® (BCP) demonstrated its stimulating effect on cartilage tissue in in vitro and in vivo (mice) studies. The aim of this orientation study was to test if oral BCP supplementation has the potency to mend OA in horses.

Animals, materials and methods:

38 privately owned horses with mild to moderate OA were available for the two-centred study. In one centre 18 of these patients (6±3 years old; 519±100kg BW) received either 25g (n=6) or 50g (n=12) BCP/day orally for 12 weeks. In the second centre 20 horses (18±4; 413±94kg BW) received either a placebo (Con; maltodextrine; n=10) or 25g BCP/day. The attending veterinarian performed an orthopaedic examination, a flexion test and evaluated the degree of lameness, rotation pain, step length and arc of flight during trot (8 parameters) at the beginning and after 6 and 12 weeks of the trial. The owners answered a weekly questionnaire about their perception of lameness, mobility and the horses' willingness to move. Statistical significance of the differences between the 3 groups (25g, 50g, Con) were tested calculating the effect size (Cohen r) for the evaluation of veterinarians and owners as well as the p values (Wilcoxon, Mann-Whitney-U-test).

Results

Data of all 38 horses from both centers were evaluated together. As expected, no adverse effects have been observed. In the 50g group in 6/8 parameters a strong effect (Cohen r>0.5) was detected between beginning and end of the trial, with 2 parameters (lameness, flexion pain) significantly improved already after 6 weeks (Table). In the 25g group a moderate effect (Cohen d=0.3-0.5) was seen in 6 parameters, with 3 parameters improved already after 6 weeks. The evaluation of the owners' answers revealed a strong effect for the factors mobility and willingness to move (Fig., Cohen r 0.69 and 0.62, respectively) in the 50g group and a moderate effect (Cohen r=0.49) for the development of lameness in both BCP groups when compared to the placebo treatment (group Con), all significant in the Mann-Whitney-U-test. The 25g dosage showed a moderate improvement (r=0.41) of the lameness.

Table: Cohen r and p values (post-hoc test) describing the changes of parameters describing symptoms of OA in horses between basic examination and after 6 weeks and 12 weeks of supplementing a placebo or 25g and 50g BCP per day, respectively

			Cohen r			Wilcoxon p		
ground	parameter	change basic vs week	Placebo	25	50	Placebo	25	50
	lameness	6	0.14	0.24	**0.56**	1.000	0.205	0.004**
		12	0.00	0.27	**0.58**	1.000	0.297	0.002**
	flexion test	6	0.14	0.17	**0.61**	1.000	0.438	0.004**
		12	0.22	0.33	**0.62**	1.000	0.125	0.001***
hard	rotation pain	6	0.22	0.43	0.46	0.625	0.031*	0.031*
hard		12	0.22	0.19	**0.55**	1.000	0.375	0.008*
soft		6	0.32	0.25	0.40	0.500	0.289	0.070
soft		12	0.39	0.12	**0.54**	0.250	0.609	0.016**
hard	step length trot	6	0.00	0.32	0.46	1.000	0.219	0.063
hard		12	0.00	0.48	0.50	1.000	0.016**	0.031*
soft		6	0.11	0.35	0.50	1.000	0.125	0.031*
soft		12	0.00	0.50	**0.54**	1.000	0.016**	0.016**
hard	arc of flight trot	6	0.29	0.18	0.50	1.000	0.625	0.031*
hard		12	0.24	0.45	**0.58**	0.625	0.031*	0.008*
soft		6	0.17	0.41	0.50	1.000	0.063	0.031*
soft		12	0.27	0.36	0.50	1.000	0.125	0.031*

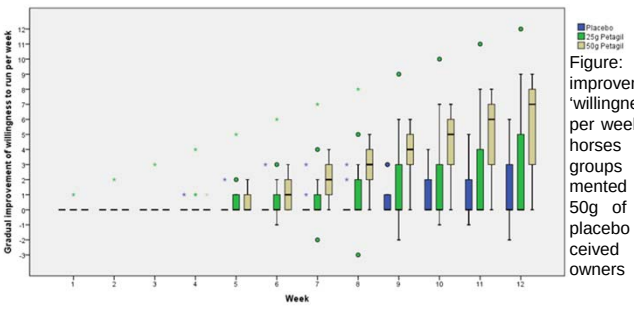

Figure: Gradual improvement of 'willingness to run' per week in the 38 horses of the groups supplemented with 25 or 50g of BCP and placebo as perceived by the owners

Discussion:

OA is a chronic degenerative disease threatening for the animals and their owners because it is one of the major reasons to force the equine athlete into retirement. Hitherto, treatment methods were limited mostly to pain management without proper options to halt the degenerative processes or even cure the disease. Experimental information and clinical observations in other species such as humans and rats led to the testing of the active substance BCP© also in chronically affected horses. The results of this pilot study give good reason to further investigate the effects of oral BCP administration on the symptoms of OA in horses. The outcome of this investigation especially after 12 weeks of supplementation of the higher dosage (50g/d) of this safe food component in equine patients with chronic OA is promising. Further blinded and placebo controlled long-term investigations on BCP efficacy in horses with OA, preferably with maximally objective parameters, are needed to confirm these first positive results of BCP treatment.