

Well-nourished cartilage does not grind

Chondropathia patellae in juveniles: Stimulation of cartilage biosynthesis improves symptoms in 80% of cases

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The treatment of chondropathia patellae is somewhat problematic therapeutically because it is not always possible initially to diagnose the exact causes of the disease and thus to take appropriate measures. The author reports here primarily on the treatment of juvenile patients suffering from chondropathia patellae and who were treated over a period of three months with Gerontamin® powder under controlled conditions. This combination preparation containing retinol acetate, cystine and gelatin is intended to normalize the disturbed biosynthesis processes in cartilage. In summary, the results of Gerontamin® administration to these selected patients of a juvenile age can be regarded as being good to very good. A decisive improvement both of subjective symptoms and objective results was achieved after only one to two month's administration of the preparation. The author is of the opinion that in the case of young patients suffering from a disease that has not progressed too far can be treated successfully 80% of the time.

In biomechanical terms, the precursor stages of arthrosis are increased water content, reduced collagen content and a decrease in the chondroitin sulfate content of cartilage. The cartilage cell consists of 50% collagen and to 30% proteoglycans and glycoproteins. It contains all the enzymes necessary for metabolism (5, 10, 12). It must thus be assumed that in the case of degenerative illness, biosynthesis is disturbed resulting in degradation of collagen and proteoglycans i.e. the basic substances of connective tissue. The equilibrium between synthesis of collagen and proteoglycans on the one hand and the simultaneously occurring enzymatic degradation on the other is disturbed, the latter gaining the upper hand. Therapeutic measures are geared to interfering with these disturbed biochemical mechanisms. The primary aims of treatment are:

- > Relief of pain
- > Inhibition of infectious processes
- > Promotion and normalization of biosynthesis
- > Maintenance of joint function
- > Possible operative measures for the correction of static influences.

This report concerns a possibility of oral treatment in special cases of chondropathia patellae, the medication being intended to promote biosynthesis of the basic substances of cartilage and simultaneously to inhibit degradation. Direct administration of glucosamine polysulfates is by intra-articular application; this guarantees the best effect, even though there is some degree of risk involved.

Table 1: Age distribution

Age (years)	Women	Men
0-20	16	8
20-30	7	18
30-40	3	5
Over 40	1	2
Total	27	33
Average age	18	21

Based on the theory that disturbance of biochemical processes causes degradation of the basic substances involved in connective tissue and that immature cartilage is simultaneously formed [7, 8, 9, 12], so-called pseudo-cartilage is formed. The nutritional status of this newly formed cartilage is dependent on the molecular condition of the glucosaminglycane proteins, the collagen fibers compete with the chondroitin sulfate proteins for the calcium.

Table 2 a: Anamnesis data

	None	Slight	Medium	Strong	No information
Pain on climbing stairs	13.5%	55%	25%	6.5%	0%
Pain on carrying out sports activity	33 %	16.5%	33%	18.5%	0%
Pain at rest	58%	23.5%	5%	0%	13.5%
Pain (duration, since)	1 month	6 months	1 year	more than 1 year	no information
	8.5%	38.5%	16.5%	23.5%	15%
Bruises	none	slight	medium	strong	no information
	58.5%	16.5%	3.5%	0%	15%
Trauma (sports activities)	71.5%	5%	8.5%	5%	10%

It is generally recognized (1, 3,11,12) that only hyaluronic acid and keratin sulfate are involved in the synthetic processes of cartilage.

The preparation used in the study, Gerontamin®, contains retinol acetate (vitamin A), L-cystine and gelatin. Vitamin A possesses membrane-activating properties (8) whereby an overdose promotes the release of lysosomal enzymes. A deficiency of vitamin A on the other hand accelerates the degradation of mucopolysaccharides (1, 3, 8, 9). The substance has a positive influence on the function of cartilage cells. Cystine is a further component and is converted to sulfopyruvate by oxidative degradation. The sulfate group of the sulfopyruvate then becomes available, subsequent to activation via ATP, for the biosynthesis of mucopolysaccharides. The gelatin makes available components and precursors for the biosynthesis of collagen. It is assumed that subsequent to the administration of gelatin over a longer period of time, a hydroxyproline pool is formed in the organism from which amino acids can be removed as and when necessary (8).

Based on these considerations, it appeared that the application of Gerontamin® would be particularly suitable for the treatment of chondropathia patellae that occurs frequently in juveniles.

Materials and methods: In our clinic as well as in a nearby army location, some 80 patients were treated with Gerontamin® over a period of three months. Certain selection criteria had to be fulfilled in the case of the volunteers. The diagnosis chondropathia patellae on the one hand was clinically established according to the criteria spontaneous pain at rest, pain on climbing stairs, provocation pain (displacement pain) as well as Zohlen signs, swelling of soft organs and possible formation of bruises (2, 6). In addition, X-ray criteria with respect to dysplasia according to Wiberg, Ficat and Baumgartl were recorded.

Table 2 b: Pre-medication

Pre-treatment	None	Ointment	Ointment and radiation	1, 2 + \$\$	Gerontamin®
	50 %	33%	8.5%	8.5%	0%
Pre-operation	none	meniscus	patella	complicated operation	no information
	70%	8.5%	8.5%	0%	13%

Other basic illnesses should not if possible be concurrent. Also, no other medication or physical treatment should be being carried out. Age and sex distribution is shown in table 1.

The dosage involved was one sachet of Gerontamin® daily over a period of three months. One sachet contains 24,000 units of vitamin A, 120 mg L-cystine and 7,000 mg gelatin.

Evaluation of results: The evaluation of the criteria according to subjective symptoms and objective investigational results resulted in several interesting viewpoints:

Table 3: Objective results

	None	Slight	Medium	Strong	No information
Retropatella grating	30%	55.5%	13.5%	0%	0%
Zohlen sign	3.5%	26.5%	56.5%	13.5%	0%
Patella displacement pain	26.5%	60%	12%	1.5%	0%
Facet pressure pain	95%	5%	0%	0%	0%
X-ray diagnosis	none	Wiberg I	Wiberg II	Wiberg III	Baumgartl
I. Dysplasia	10%	6.5%	11.5%	46%	23.5%
II. Special comments	Haglund-Delle	patella alta/lata	patella bipartita	Jägerhut	arthrosis
	17.5%	10%	1.5%	4%	5.5%

Most frequent complaint: symptoms on climbing stairs

The very high subjective rate of 86.5% on climbing stairs became evident right at the beginning. At rest, 58% were free of symptoms. Also, 60% of the volunteers had no bruises and in over 70% there were no traumas or extraordinary sporting activities indicated (table 2 a).

However, 50% of those examined had been pre-treated, 33% of these with ointments, a further 3.5% with additional radiation and another 8.5% with multi-applications such as intra-articular injections (table 2 b). In the case of sporting activities, as far as sport was carried out at all, only few symptoms were indicated. 40 of the 60 patients indicated symptoms of which only 10 (25%) could no longer carry out sporting activities due to the pain involved.

In the tabular summary (table 3) of objective results, the high proportion of positive Zohlen signs is evident.

Evaluation of X-ray analysis indicates an apparent connection with dysplasia of the patella, in particular of the type Wiberg III (46%) and a total of 90% dysplastic forms whereby only 17.5% show a Haglund excavation. Special forms of the patella are less important.

Results of treatment: Subsequent to one, two and three months respectively, the patients were subjected to re-examination. It was established that the subjective indications, in particular the large number of positive symptom indications (86.5% of the patients suffered pain whilst climbing stairs) had improved considerably (56%) after only one month. With respect to pain at rest, success was not quite so satisfactory; 41% of patients who had indicated these symptoms initially complained of occasional pain at rest. On the basis of subjective information on general condition, it can be said that approximately 75% of patients were either symptom-free (45%) or had clearly improved symptoms (30%) subsequent to three months of Gerontamin® treatment. The remainder of the patients still continued to have pain at rest (table 4 a).

Table 4 a: Evaluation of subjective information subsequent to Gerontamin® administration

	Number of cases		Free of symptoms		symptoms at rest
	initially	after 1 month	after 2 months	after 3 months	
During sporting activity	40	30%	25%	20%	26%
Whilst climbing stairs	52	56%	31%	13%	0%
At rest	17	24%	24%	12%	40%

The evaluation of objective criteria showed similar good results (table 4 b). Of these results, the influence of the Zohlen sign should be emphasized. This cartilage grating that can be both heard and felt during passive movement can be regarded as a typical symptom of chondropathia patellae. Already after one month's treatment, 47 of the 58 patients no longer had this symptom.

Only those with sensitive stomachs complained of incompatibility

The remaining symptoms that later led to relapse and possible operation were all obvious right from the beginning so that in these cases the disease had progressed too far in order to be influenced by treatment.

Table 4 b: Evaluation of objective results

	Number of cases initially	After 1 month	After 2 months	After 3 months	Remainder
Friction sounds	42	17%	10%	8%	65%
Zohlen sign	58	80%	10%	8%	2%
Displacement pain	44	80%	9%	4.5%	2.5%
Facet pressure pain	3	./.	55%	34%	./..
Bruises	34	42%	30%	24%	4%

In our opinion, the administration of Gerontamin® to patients who had indicated symptoms with respect to anti-rheumatic drugs should also be given a stomach-protecting preparation in order to reduce the relatively high fallout rate of 10% due to incompatibility.

Side-effects occurred in 8 of the 60 volunteers. Each of the 8 patients indicated a high stomach sensitivity during anamnesis, in particular for anti-rheumatic drugs so that in these cases a pre-bias existed. They consisted of an aversion to the taste or the feeling of pressure generated in the stomach subsequent to ingestion. In one case, increased hair and nail growth was reported.

As the evaluation of the results shows, the administration of Gerontamin® as an oral treatment for chondropathia patellae in juveniles proved successful. Of the 60 volunteers investigated, we found, on evaluating the subjective symptoms, a good to very good result (66 to 80%); the same applies to the objective results (35 to 98%) subsequent to a three-month application of Gerontamin® powder.

We were surprised at the high number of juveniles represented in our total number of patients. As confirmed by Rössler, this is a function on the one hand of the increased development of muscle in juveniles together with a certain tendency towards activity. At the same time, however, nutrition, particularly of dysplastic rear surface of the patella with its very thick cartilage, is insufficient. This nutritional deficiency is amplified by a lack of counter-pressure at the rear of the patella. In juvenile patients with chondropathia patellae, it is possible, in 80% of cases, to restore the regeneration of cartilage under moderately dysplastic conditions. In the remaining 20% of cases where treatment failed, arthroscopic clarification could be discussed and, on diagnosing the presence of a cartilage-softening source, an operation according to Viemstein (capsule discission) could be recommended as the next step.

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