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ORIGINAL ARTICLE

Primary benign back pain: supplementation with Pycnogenol®

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ABSTRACT

BACKGROUND: Back pain (BP) is one of the most common problems seen by general practitioners. The aim of this pilot registry study was to evaluate the effects of Pycnogenol® (French Pine Bark extract) on pain, mobility and muscle spasm in patients with recurring episodes of back pain without any other clinical condition.
METHODS: The registry follow-up lasted 3 weeks. Subjects used either SM (standard management), including mild exercise and 3 days of resting or immobilization - or SM+Pycnogenol® 200 mg/day (4 cps/day).
RESULTS: Eighty-two subjects were included in the study, 23 took Pycnogenol® and 59 were in the SM group. No safety problems or tolerability problems were observed with Pycnogenol® or with the SM. The two groups, SM and SM+Pycnogenol®, were comparable at inclusion. A prevalent localization to the lower part of the back/spine was observed in all patients of both groups. The improvement in Karnofsky performance status Scale — expressing the global physical capacity of the individuals — during the 3 weeks of follow-up was significantly higher and faster in the Pycnogenol® group ($P<0.05$) compared to SM. Patients were able to restart physical training in 3 weeks with Pycnogenol® (in comparison with 4.5 weeks with SM only). The decrease in back pain score (VASL score) was faster and more pronounced with Pycnogenol® ($P<0.05$) compared to SM. Oxidative stress was significantly reduced in subjects using Pycnogenol® ($P<0.05$) while it remained elevated in the control group. The use of the rescue medication doses (ibuprofen) was significantly higher in the SM only ($P<0.05$) in comparison with SM+Pycnogenol®.
CONCLUSIONS: Pycnogenol® appears to be an effective and safe supplementary management in healthy subjects with idiopathic BP. Mobility, pain, general physical capacity and oxidative stress improved in only a week with further improvements up to 4 weeks in most patients; results appear to be better and faster with Pycnogenol® supplementation than with SM alone.

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KEY WORDS: Back pain; Pycnogenols; Dietary supplements; Pain.

Back pain (BP) is one of the most common problems seen by general practitioners (GPs). Pain is usually accompanied by neurological symptoms. When a nerve root is affected, pain radiates distally along the nerve distribution (radicular pain). Sensation, strength and function may be impaired along the root distribution. If the cauda equina is affected, segmental deficits may develop in the lumbosacral region typically with disruption of bowel functions (constipation or incontinence) and even alterations in bladder functions, such as retention or incontinence, loss of perianal sensation, sometimes erectile dysfunction, loss of rectal tone and sphincter, bulbo-cavernous or anal wink reflexes.

Any painful disorder of the spine may also cause reflex tightening (spasm) of paraspinal muscles, which can be excruciating.[1]

Most episodes of BP are caused more by neurological problems than by bone problems but often the problems are associated. Fibromyalgia is a less common cause of BP but may be concomitant; however, in this condition, BP tends to be atypical.

Extraspinal disorders (vascular, gastro-intestinal, genitourinary problems) are less often causes of BP and are generally more serious (*i.e.*, pleuritis, hepatic problems, aneurysms dissection etc.). Myocardial or intestinal in-

farctions are also possible severe causes of BP. Most spinal pain causes are mechanical *i.e.* non-specific derangements, such as changes in the anatomical position of the vertebrae. Inflammation, cancer or fractures associated with osteopenia are considered relatively uncommon causes for BP.

The differential diagnosis must include muscle strain, ligament sprain or a combination of the two.

Also, postural problems and decreased spine flexibility are involved. Fifteen per cent of BP cases involve anatomical lesions, such as disk herniation, fractures, spinal stenosis, osteoarthrosis or spondylolisthesis.[1]

Back pain can be also associated with weightlifting and running in otherwise healthy subjects. In most cases, however, BP has a multifactorial origin.

Management of benign BP (without complications) is based on analgesics, muscle relaxants, spine and particularly lumbar stabilization, mild exercise and physical measures.[2-8] Acetaminophen or NSAIDs (in some cases even opioids) may be used. Often, analgesia is useful to 'restart' the patient. Lumbar stabilization and exercise and/or physiotherapy, including spinal elongation are effective. Working the posture and strengthening the structures supporting the spine is generally effective. The elongation of spine with specific exercises can restore disk thickness and reduce spinal compressions. Muscle spasms — if present — may be relieved by physical measures (heat, cold). Muscle relaxants (cyclobenzaprine, methocarbamol, metaxalone) are controversial because they can cause central nervous and peripheral side effects. Muscle relaxants should be used in patients with visible and palpable muscle spasm. The use of corticosteroids for BP is controversial and left for more severe cases.

The aim of this pilot registry was to evaluate the effects of Pycnogenol® (French maritime Pine Bark extract) on pain, mobility and muscle spasm in healthy patients with recurring episodes of BP without any other clinical condition.

Materials and methods

Subjects with recurring episodes of back pain in good conditions were included into the registry study. No other clinical condition or risk condition was present. No drug was used.

The common factors associated with BP — lasting more than one week — were hours of prolonged sitting in the office, in the car or both. Previous bone/joint and particularly spinal fractures or traumas were exclusion criteria.

This was confirmed by X-ray of the column and back bone structure to exclude significant bone lesions that could be associated with back pain. The pain in all subjects was defined as mild-moderate. The subjects were all healthy and usually practicing outdoor sports at least 4 times/week. The registry follow-up lasted 3 weeks. Subjects used either SM (standard management - including mild exercising after the initial 3 days of resting or immobilization) or SM + Pycnogenol® 200 mg/day (4 capsules/day). Pycnogenol® is a highly standardized supplement. It has been used in several recent studies — involving mild-moderate pain management or controlling inflammation — with remarkably high levels of efficacy and safety and with a very good tolerability.[9-18] In addition, cramps and muscular pain can be prevented with Pycnogenol® in normal subjects and patients (including venous patients, athletes, claudicants and subjects with diabetic microangiopathy).[17]

The aim was to have an on-site management without the need for the patients to go to a center for physiotherapy or to a gym, adding more stress and time. In case of more severe pain, subjects observed 1-3 days of rest and relative immobilization. All patients observed 1-2 days of decreased activity (controlling or abolishing the time spent sitting in the same position) and avoiding weights. Physiotherapy or spinal manipulation were not used in this registry. The mild exercise program (to be performed twice daily) was individually designed for each subject after the initial period of rest, to be performed at home or at work. Weightlifting was avoided.

Any vascular disease was excluded[19] based on a full, noninvasive cardiovascular screening.

The Karnofsky performance status scale variations (0 to 100) were assessed with a visual analogue scale line evaluating individual variations in (VASL) score (0-10) (Cyrill Maxwell).

Back pain was assessed with a visual analogue scale line evaluating individual variations (VASL 0-10) 0: no pain; 10: pain+immobilization.

The D-roms Test was used to evaluate oxidative stress. With one drop of blood it is possible to measure local oxidative stress at the finger, within minutes. The test has been validated in several clinical studies.[20-22]

Exercises associated with SM are shown in summary in Figure 1. Oxidative stress was measured at inclusion and after 7 days.[23, 24]

Ps supplement studies

These registry studies[20-22] define the field of activity of pharma-standard supplements (supplements of natural ori-

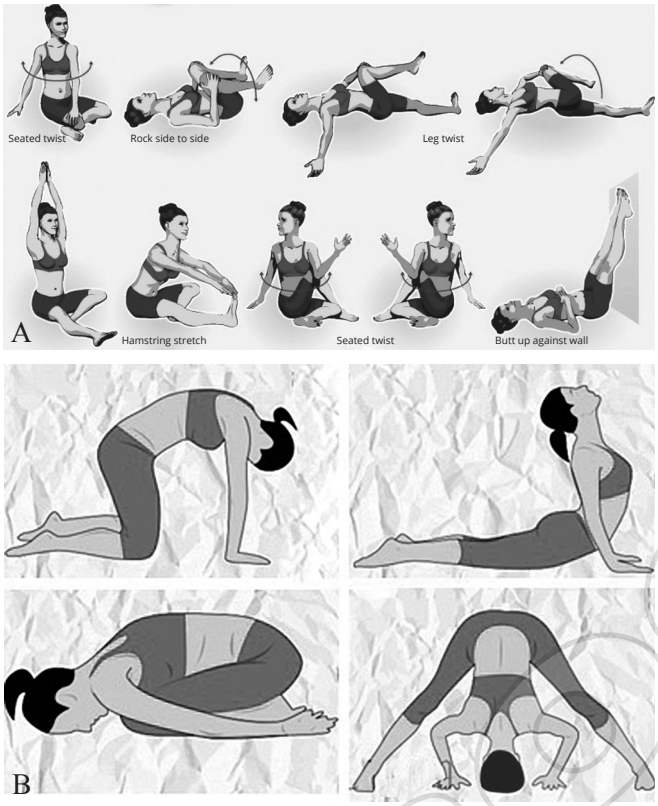

Figure 1.—A) Basic exercises: simplified; B) lower back pain.

gin, in pharmaceutical standards) and their possible preventive, preclinical applications. The best fields of application for supplements are preclinical, borderline applications or the supplementary management of risk conditions. PS supplements, unless there are specific claims, are not generally used for the treatment of clinical conditions.

They are used to manage 'minor' medical problems. Supplement studies produce supplementary data to be compared to "background" historical data (*i.e.*, based on the best available management for comparable subjects) or to other management plans. In this study, the supplement was used according to the following rules: 1) the use of the supplement should not have interfered with any other treatment, management or preventive measures; 2) the period of follow-up was considered variable, according to the needs and availability of the patients or registry subjects. The observation period is therefore variable and not prefixed. Ideally, the supplement should be used as long as needed to see results or changes; 3) the type of evaluation for these studies is always a registry. The evaluation of the compliance concerning the use of the supplement is a significant value indicating how many subjects are actually willing to use the product; 4) in supplement studies, there is no defined group allocation and no randomization organized by the investigators. Subjects decide — on the basis of an initial briefing — which management group they want to join, including the control (non-supplement) group. No placebo was used.

Statistical analysis

Statistical analysis was performed with a Sigma-Plot software package; the analysis of the variance and the Mann-Whitney U-Test were used (considering results as non-parametrical data). The proportion of included samples in the management group was calculated in groups of at least 20 patients to detect significant changes in the measurements of before-after periods. Spontaneous intra-individual and inter-individual variations (5-10% in most measurements) are possible as a consequence of spontaneous variations. An arbitrary cut-off point (at least a >10% variation) in parameters was considered to be valid to define significant changes due to management.

The values of back pain scores and Karnofsky performance status scale measurements (ability to perform) were not regularly distributed and measurements variations were evaluated by non-parametric tests.

Results

Safety: no safety problems or tolerability problems were observed with Pycnogenol® or with SM.

Details of the included patients are shown in Table I. Eighty-two subjects were included in the study, 23 took Pycnogenol® and 59 were in the SM group.

The two groups SM and SM+Pycnogenol® were comparable at inclusion.

TABLE I.—*Details of the included subjects.*

	Number of cases using Pycno + SM	Only SM
Inclusion, Day 0	23	59
Age	46.7±2	46.8±3.1
Day 3	23	56
7 days	23	52
Oxstress at inclusion	388±22	386±13
Oxstress at one week	332±21	388±17*
14 days	21	51
Completing Day 21	18	49
Use of rescue medication (in 3 weeks)	2/23	43/59*

Rescue medication: Iprupofen Sandoz; 200 mg tablets.
*P<0.05 in comparison with SM (standard management).

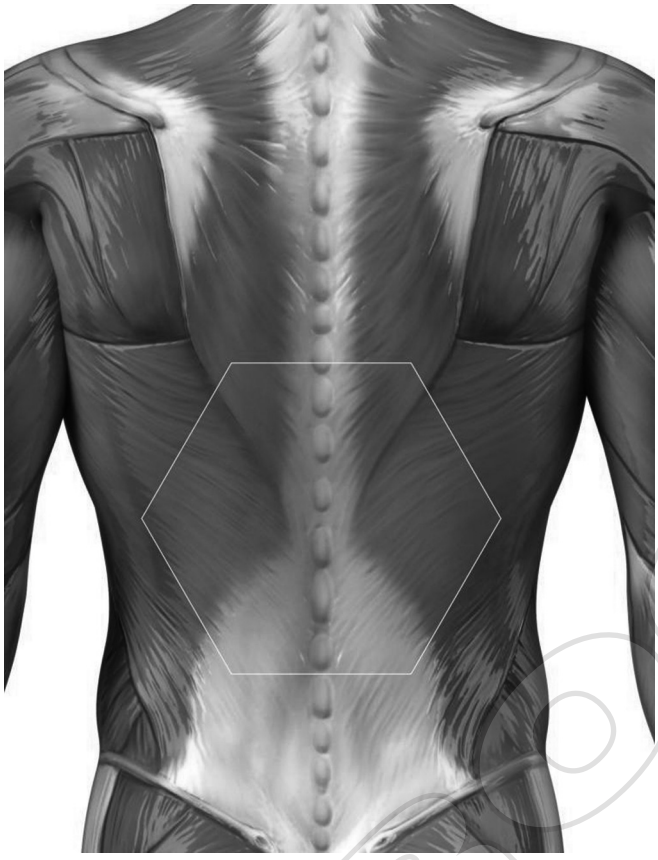

Figure 2.—The most common localizations of prevalent BP in this group of patients have been diagnosed within the area shown in this figure.

A prevalent localization of the pain in the lower part of the back/spine was observed in all patients in both groups (Figure 2).

Oxidative stress

Oxidative stress was significantly reduced in subjects using Pycnogenol® in comparison with standard management (P<0.05) (Table I).

The use of rescue medication doses (Ibuprofen) was significantly higher with the SM only (P<0.05) in comparison with Pycnogenol®.

Table II, Figure 3 show the changes in Karnofsky performance status scale — expressing the global physical capacity of the individuals — during the 3 weeks of follow-up. During the observation period, the improvements (in percentage) in Karnofsky performance status scale (Table II, Figure 3) were significantly more important and faster in the Pycnogenol® group (P<0.05) in comparison with standard management.

TABLE II.—*Comparative variations in Karnofsky performance status scale (0-100) for BP.*

	SM+Pycnogenol® Score	SM only Score
Inclusion	66.3 (60-69)	67 (61-72)
3 days	74 (70-77)*	69.2 (63-72)
5 days	76.3 (71-81)*	71.2 (62-75)
7 days	78.3 (72-83)*	73.1 (63-78)
14 days	90.2 (84-100)*	86.4 (78-91)
21 days	94 (88-100)*	90.2 (83-96)

Values are expressed as median (and range).
The Karnofsky performance status Scale values are:
100 Normal no complaints; no evidence of disease.
90 Able to carry on normal activity; minor signs or symptoms of disease. Able to carry on normal activity and to work; no special care needed.
80 Normal activity with effort; some signs or symptoms of disease.
70 Cares for self; unable to carry on normal activity or to do active work.
60 Requires occasional assistance but is able to care for most of his personal needs. Unable to work; able to live at home and care for most personal needs; varying amount of assistance needed.
50 Requires considerable assistance and frequent medical care.
40 Disabled; requires special care and assistance.
30 Severely disabled; hospital admission is indicated although death not imminent.
20 Very sick; hospital admission necessary; active, supportive treatment necessary.
10 Moribund; fatal processes progressing rapidly. Unable to care for self; requires equivalent of institutional or hospital care; disease may be progressing rapidly.
0 Dead.

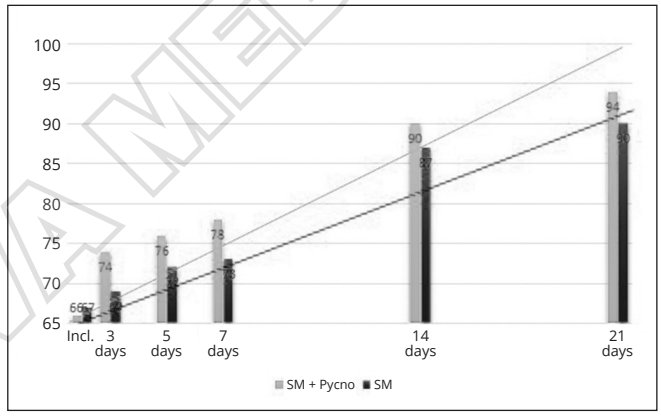

Figure 3.—Variations in Karnofsky performance status Scale.

Table III, Figure 4 show the decrease in back pain as VASL Score in the two groups. The decrease was faster and greater with Pycnogenol® in comparison with standard management (P<0.05).

Patients were able to restart spontaneous sport training on average in 3.1±0.2 weeks with Pycnogenol® supplementation; in comparison, the SM group subjects started retraining on average at 4.5±0.32 weeks. The difference is statistically significant (P<0.05).

Subjects that were lost and not controlled after 21 days were unable to be re-evaluated only for logistical reasons but had no other clinical problems.

TABLE III.—*Variations in average VASL Score (0-10) with SD.*

	SM+ Pycnogenol®	Only SM
Inclusion	9.3±1.2	9±1.1
3 days	8.1±1	8.4±0.3
7 days	6.3±0.8	7±0.2
14 days	3.1±0.3	4.4±0.4
21 days	2.2±0.3	3.4±0.2

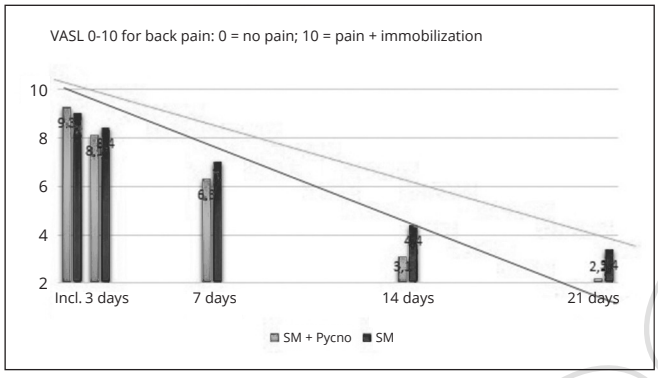

Figure 4.—Visual Analogue Scale line for back pain.

Conclusions

Pycnogenol® supplementation is safe and well tolerated in otherwise healthy subjects with idiopathic, and benign back pain without any other significant clinical problem.

Pycnogenol® is considered safe and can be used without prescriptions[25] even for prolonged periods. But in every case of BP consultation with a physician, it is always essential to exclude serious problems (*i.e.* even a dissection of an aortic aneurysm may cause back pain). The combination of the anti-inflammatory effects, the effect on reducing pain and possibly the control of muscle spasm (as we have seen in previous studies) seems to make Pycnogenol® a winning and safe treatment for these patients.

It should be taken into account that in the present clinical situation of mild-moderate back pain in healthy subjects with a recurring problem, only 30% of subjects go to their physician for further advice (as they had discussed the problem before) and most patients tend to self-treat or medicate themselves. However, even in a common, borderline clinical condition (in healthy sport subjects) such as BP, all other clinical aspects associated with back pain should be necessarily, carefully excluded, including vascular problems which may be commonly present in several subjects with BP symptoms.[26] Back pain must only be diagnosed and managed by physicians. Mild-moderate pain can be more effectively assessed by measuring the relative alterations in mobility and the disruption in life patterns it causes on healthy, active subjects.

The decrease of oxidative stress in these patients — observed with Pycnogenol® supplementation — may also be a significant clinical point to address in future studies on syndromes associated with transient muscular pain as in BP.

Predictive analytics (according to Siegel)[27] made with data and results obtained at the end of the study indicated that a larger study (including about 100 subjects with different BP patterns for at least 2 weeks) can be very indicative of the positive effects of Pycnogenol® in this common condition. In this frequent (often distressing but benign) condition, a cost-efficacy analysis would be indicated in planning a study[28] as BP uses a considerable amount of time and resources for GPs and healthcare suppliers that may be shifted towards more pressing conditions and life-threatening problems.

In conclusion, Pycnogenol® appears to be an effective and safe supplementary management in healthy subjects with idiopathic back pain. Altered mobility, pain and oxidative stress improved in only a week of regular intake of Pycnogenol® with further improvements after up to 4 weeks in most patients that start physical training again

These results appear to be better and faster with SM+Pycnogenol® than with SM alone.

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