CLINICAL EFFECTS OF OVERWINTERED-STRESSED CHONDRUS CRISPUS AND NON-OVERWINTERED-STRESSED CHONDRUS CRISPUS DIETARY SUPPLEMENTATIONS

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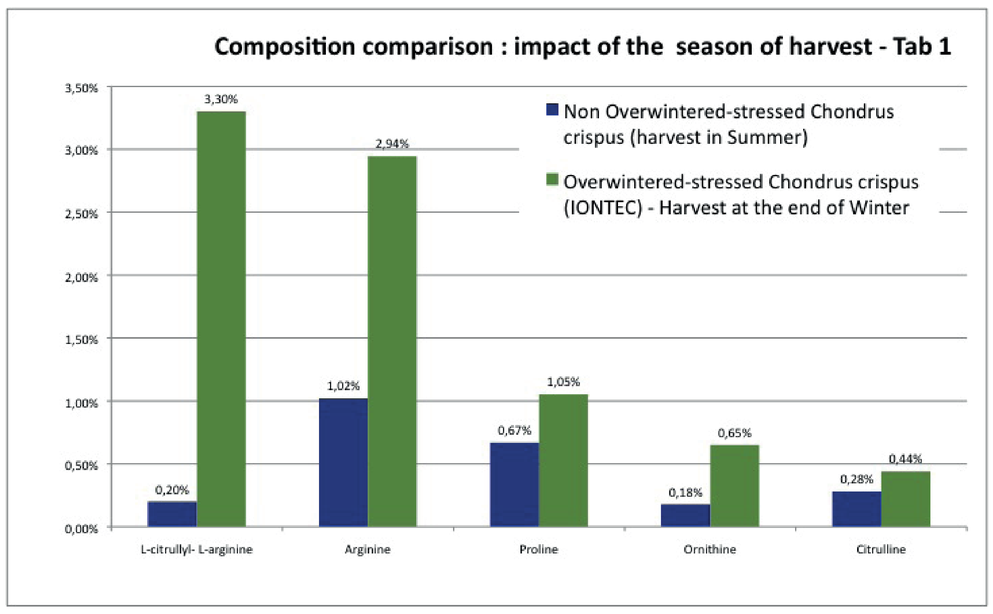
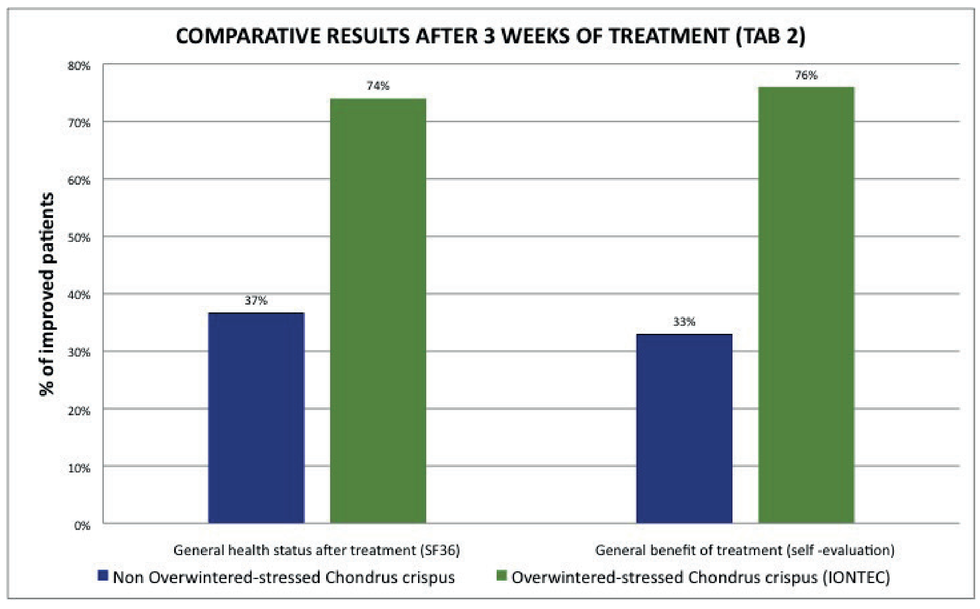
ABSTRACT 1

This retrospective observational "not inferiority" study investigates and compares the clinical effects of overwintered-stressed *Chondrus crispus* and non-overwintered-stressed *Chondrus crispus* dietary supplementations for the treatment of musculoskeletal and articular symptomatology related diseases. 80 patients were retrospectively reviewed, 50 were treated with overwintered-stressed *Chondrus crispus* and 30 were treated with the non-overwintered-stressed *Chondrus crispus* dietary supplementation. The general benefit of treatment with overwintered-stressed *Chondrus crispus* was 76%, while that obtained with non-overwintered-stressed *Chondrus crispus* was 33.3% ($p<0.01$). This retrospective observational comparative study evidences that overwintered-stressed *Chondrus crispus* proved musculoskeletal and articular symptomatology related diseases better than non-overwintered-stressed *Chondrus crispus*.

OBJECTIVE 2

Chondrus crispus is red seaweed widespread in the northern Atlantic coasts to the high proteins, burden it is quite helpful supplement for some symptoms such as fatigue, asthenia, and weakness and for supporting skeletal muscles in sports athletes. The seaweed has a high total protein content, oligopeptides and pigments, is rich in water-soluble carrageenan polysaccharide (3,4) indeed in folk medicine, it is reputed as effective supplement for some symptoms such as fatigue, asthenia and sport of skeletal muscles (1) (Tab 1).





MATERIALS AND METHODS 3

We reviewed medical records of 80 patients that had appealed to our "Second Opinion Medical Network"[2], because of musculoskeletal and articular symptomatology. Patients were aged over 40 years and were affected at least 6 months by different clinical conditions with an attested related symptomatology and diagnosis. In our clinical practice, we washed out previous treatments for a period of 2 weeks, and then the dietary supplementations were administered. The study lasted 3 weeks. At the start up the patients were prescribed 3 capsules/day after the main meals of overwintered-stressed *Chondrus crispus* of either non-overwintered stressed *Chondrus crispus* dietary supplementations, supplied by Iontec (Monaco).
The first clinical examination consisted in the evaluation of the physical status of the patient. The statistical analysis was performed using the Mann-Whitney test and the chi-squared test. Statistical significance was set at a $p<0.05$, and all data were analyzed using the R software.

RESULTS 4

The general benefit of treatment, observed in auto-evaluation questionnaire, with overwintered-stressed *Chondrus crispus* was 76%, while that obtained with non-overwintered-stressed *Chondrus crispus* was 33.3% ($p<0.01$).
These results are confirmed by the quality of life questionnaire(SF-36) where the general health status after the treatment demonstrated that 37 patients (74%) and 11 patients (36.7%) felt better than before in the overwintered-stressed Chondrus Crispus and non-overwintered-stressed *Chondrus crispus* group, respectively ($p < 0.01$) (Tab 2). A great improvement of subjective exhaustion, fatigue, pain, digestive, and peristalsis disturbances symptoms, in addition to mood and concentration improved that would be a consequence of symptomatology regression, was also observed.

CONCLUSION

This retrospective observational "not inferiority" study showed that overwintered-stressed Chondrus Crispus dietary supplementation improved musculoskeletal and articular symptoms with underlying inflammatory and degenerative background better than non-overwintered-stressed Chondrus Crispus, with very mild side effects. Specifically, it has been observed a great improvement of exhaustion, fatigue, pain, digestive. A possible explanation of this different performance is that overwintered exposition of Chondrus Crispus naturally enriched the seaweed in a dipeptide, the L-citrullyl-Larginine, compared to other sources of regular Chondrus Crispus. The benefits of overwintered-stressed Chondrus Crispus might also depends on the higher total proteins concentrations compared to the non-stressed red seaweed respectively and amino acids content as especially arginine and citrulline (Tab1). In conclusion, overwintered-stressed Chondrus Crispus supplementation displayed most energizing properties than the non-stressed red seaweed dietary supplementation.

Declaration of conflict of interest: The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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