

Use of cryotherapy in sports injury rehabilitation: Report of a survey

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ABSTRACT

Though Cryotherapy is widely used in the field of Sports injury rehabilitation, due to its therapeutic uses and availability, the method of application varies among Sports injury specialists. Appropriate selection and application of therapeutic modalities is the key to success in rehabilitation. Lack of structured guidelines pertaining to sports injury rehabilitation led to the considerable variability in Practicality. It is important to find out the variability in the usage of Cryotherapy, in order to establish an acceptable protocol., **Method:** A structured Telephonic survey was conducted among 40 professionals working in the field of Sports., **Results:** There was diversity in the method of application of cryotherapy among the professionals working in the field though all of them preferred cryotherapy in acute sports injury management. Direct applications by using simple methods were considered by the majority of the therapists. Ideal dosage of cryo application remains controversial., **Conclusion:** There is a need to prepare an Evidence Based Guideline regarding the application of Cryotherapy in sports injury Rehabilitation.

Keywords: Cryotherapy, sports injury, physiotherapy, therapeutic modalities

INTRODUCTION

Return to activity after an injury is one of the most important aspects of successful rehabilitation. (Chris Bleakly and Suzanne McDonough , 2004, Tricia J Hubbard and Craig R Denegar ,2004 Tricia J Hubbard et al., 2004 - give numbering) Cryotherapy is one among the simplest and oldest therapeutic modality in the treatment of acute soft tissue injuries.(Nicole et.al ,2002 Chris M Bleakley, 2007 - give numbering) . Application of ice mainly helps to decrease the tissue temperature, diminish pain, metabolism and muscle spasm, thus facilitate recovery. (Michael Andrew Kowal, 1983 - give numbering)

Although ice has been one of the most frequently used modality for soft tissue trauma, the strength of the evidence supporting its use is poor. Most of the research in the field of cryotherapy has been done on post operative cases wherein it reduces pain and allows early movement; however the rationale for the use of ice in sports and for rehabilitation purposes remains different.

There has been an attempt to establish international guidelines for the use of cryotherapy; however most of them have not been able to come up with a specific protocol for the use of the same. (Kate Kerr et al., 1998 give numbering). The majority of the guidelines that exists for cryotherapy have failed in formulating well structured guidelines mainly owing to the lack of well designed randomized controlled trials. Such dearth of literature has left us to rely on established recommendations for cryotherapy mentioned in standard textbooks, which in itself is not conclusive and has lead to considerable debate over the selection of parameters in the clinical scenario.

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Current era of evidence based practice emphasizes research evidence, clinical expertise and the inclusion of patient values in rehabilitation. Management of acute injuries in the sports arena poses challenges to professionals working in this field. Cryotherapy as a modality stands no dispute but there is no uniformity in the method of application and dosage. It has been felt that there is a need to explore the usage of cryotherapy in the developing countries.

The objectives of this study were as follows:

1.To evaluate the current clinical practice of cryotherapy used by experts in the filed of sports injury rehabilitation

2.To explore the need of a standardized protocol for the administration of cryotherapy in acute soft tissue injury.

METHODS

A structured telephonic interview was conducted among the various sports specialists. The survey was conducted on a national level with the therapists included from various areas of the

sporting field. The survey consisted of both open ended and closed ended questions. There were eight simple questions which were asked regarding the method of cryotherapy, duration of application and the indications of use. The mean time spent per respondent was 15 minutes. The responses that were obtained were analyzed and are presented here using descriptive statistics

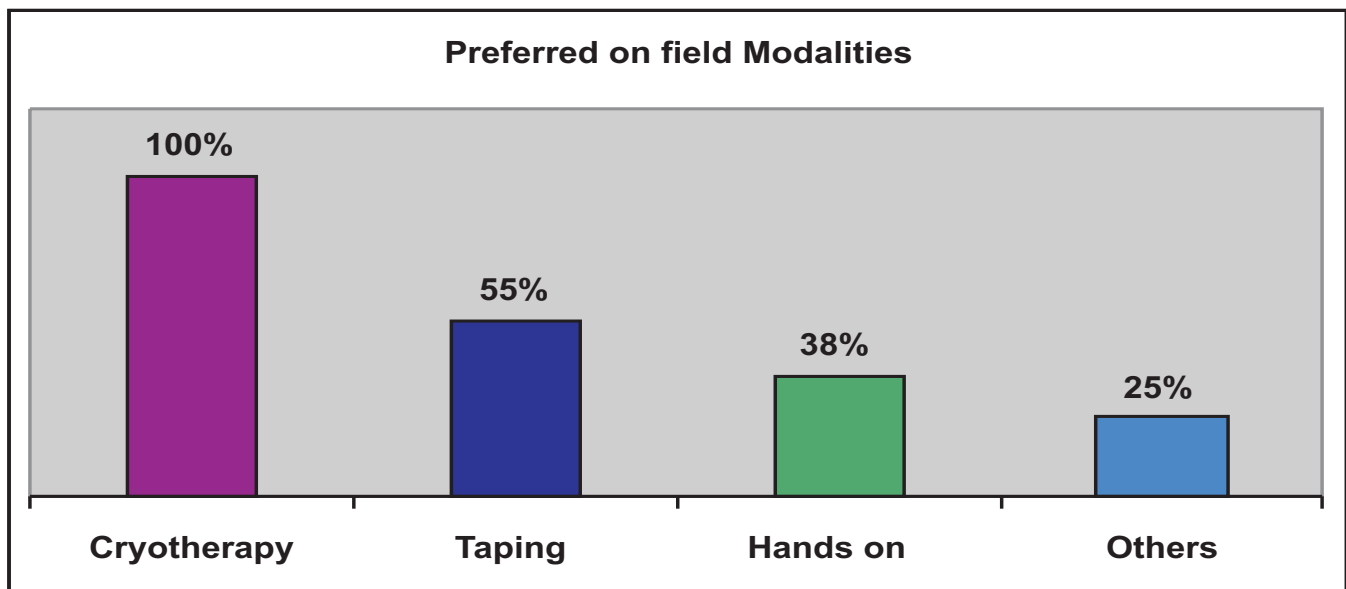
RESULTS

We interviewed forty sports specialists who were part of teams participating at the state, national and international levels. Our respondents were mainly in the mean age group of 29 years ± 2.5 years. Most of them had a mean experience of 3.9 ± 2.6 years in the sporting field.

Majority of our respondents were specialised in sports physiotherapy (92.5%), one was a sports medicine doctor and we had two therapists who were bachelors in physiotherapy and were with teams at the national level.

When asked about the modalities that were used on field in acute injuries 100% of the respondents said that they have used cryotherapy.

Figure 1: Most Preferred Modalities in Sports Field

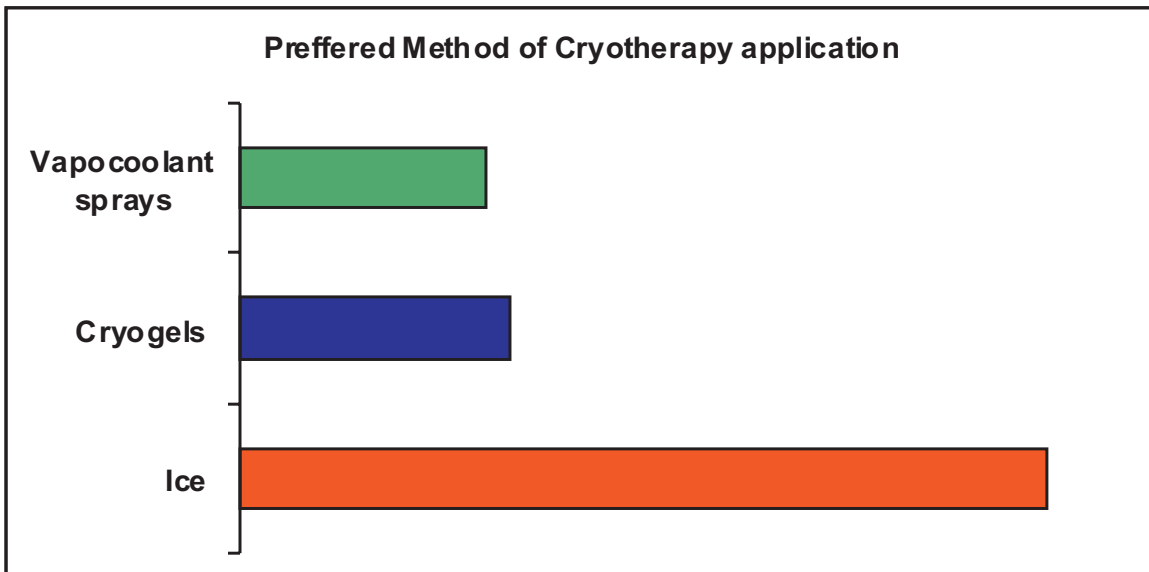


About 55% have also used taping . 38% said that they have used hands on treatment in terms of sports massage and post isometric relaxation techniques , while 25%feel that they most often rely on first aid kits - (repetition of the Figur 1. The same thing is mentioned in text and presented in figure, try to avoiv such type of repetition) .

In case of an acute injury all the respondents answered that the most preferred modality is cryotherapy but majority of them differed in the method of application of ice.

(90%) preferred the use of ice in a simple polythene bag or crushed ice applied with a towelling. Few of them even preferred the use of

Fig 2: Respondants Preferred Method of Cryotherapy Application

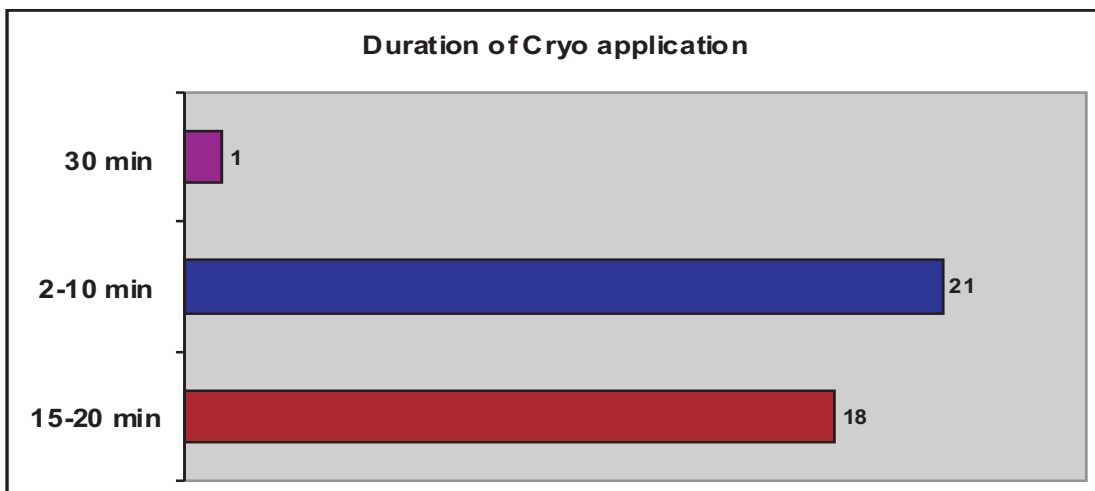


ice massage. (30%) of the therapists stated that cryogels were also used ,which were also found to cause considerable cooling - (repetition of the figure 2). Most of these applications were given in combination with compression or elevation as it is done traditionally in case of any acute soft tissue trauma. Very few of them(27%) reported

the use vapocoolant sprays as part of their management in order to produce an immediate analgesic effect.

There was again considerable controversy over the duration of application. Among the responses that were obtained 2 to 10 mins of ice application

Fig 3: Duration of Cryo application



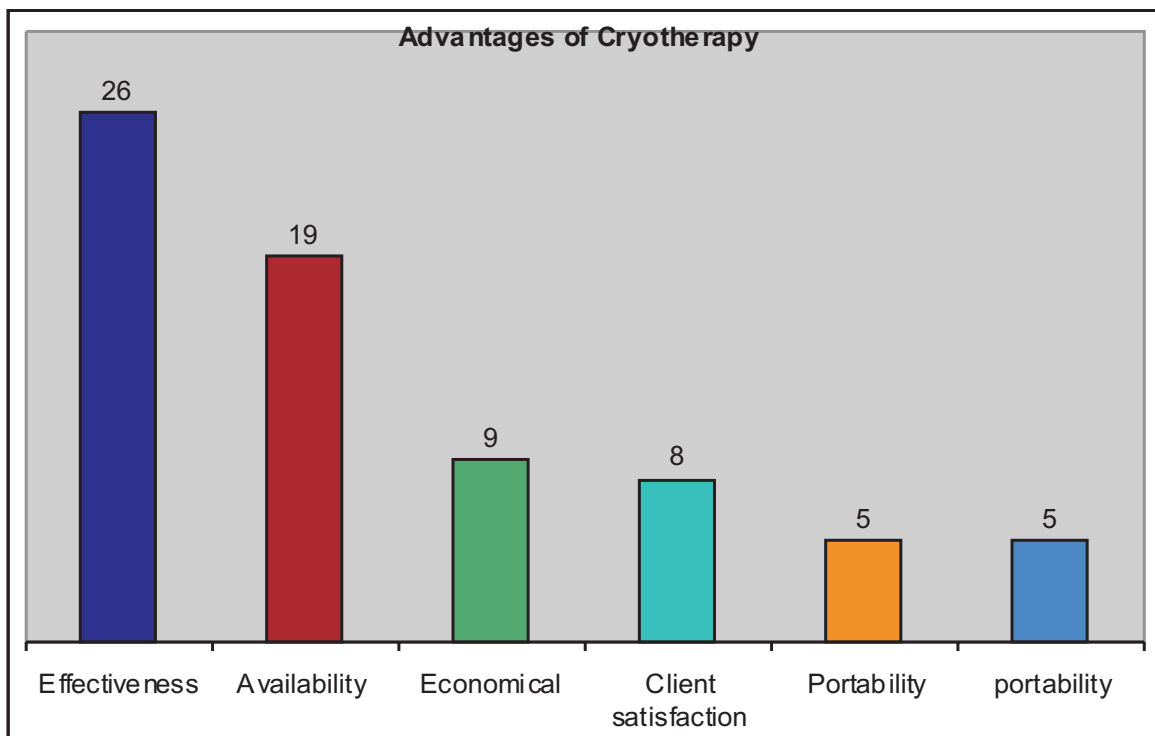
was the most preferred. Therapists also preferred application of ice for a period of 15 to 20 mins to achieve a cooling effect.

Though cryotherapy was widely used in the acute set up the situation was quite contrary when the therapists were asked about their choice of treatment in chronic injuries. Most of them suggested (57.5%) that they would go with other modalities and found that cryotherapy was efficient only in acute injuries. 42.5% felt that cryotherapy was equally effective for chronic injuries.

One of the major precautions that were reported was not to apply the ice directly over the part to be treated. Open injury was another precaution which was highlighted during decision making. Few of the therapists suggested that they follow textbook contraindications while others felt that they were no specific precaution that is necessary for an effective modality like ice.

These were the advantages of cryotherapy over the other modalities in acute sports injuries expressed by the respondents.

Fig 4: Respondents Perceived advantages of Cryotherapy



DISCUSSION

Respondents of the present study were associated with teams at state, national and international levels. As mentioned earlier most of our respondents were specialized in sports physiotherapy.

When asked about the modalities that were commonly used on field most of the therapists felt that cryotherapy, taping and hands on techniques were the most commonly used therapeutic modalities. The choice of the modality would ultimately depend on the nature of the injury and

the discretion of the therapist. The hands on techniques that were commonly cited were techniques like sports massage, post isometric relaxation, stretches, effleurage, kneading depending on the injury at hand. These techniques may be used along with Cryotherapy.

The effectiveness of cryotherapy in the treatment of acute soft tissue injury is well established though the physiological mechanisms still remain unclear. Literature says that cryotherapy is the modality of choice in acute injuries (Kate Kerr 1998, Bleakly and Suzanne McDonough, 2004, Tricia JH 2004, Mike S, 2005-

give numbering). Cryotherapy definitely improves outcomes after an acute soft tissue injury facilitates repair and hastens recovery. In case of an acute soft tissue injury cryotherapy mainly prevents the secondary hypoxic injury (Mark A Merrick, 2002- give numbering) that ensues after the primary damage thus preventing further deterioration of the condition.

Therapists differed in their method of application of ice. Majority of them preferred application of crushed ice in a towel or polythene bag. Few reported that the application of ice massage was not practically possible in most of the situations on field. Most of the therapists who were associated with state teams mentioned that they did not have access to cryogels or vapocoolant sprays which may not be the situation when they work for elite teams. Those who preferred using cryogels state that while using crushed ice the temperature of the ice cannot be maintained which is a disadvantage. Vapocoolant sprays were effective in causing instant pain reduction especially for muscular injuries. The findings of the survey go well in accordance with the study carried out by (Rosalind B. Belitsky et al., 1986), (Linda S. Chesterton, 2002), (Rotsalai Kanlayanaphotporn 2005) , (Jane Kennet et al., 2007- give numbering), reporting that crushed ice application or ice water immersion was the most effective in reducing skin temperature than cryogels. Research reports that the application of cryogels were more effective than no intervention at all (Olavi V. Airaksinen et al., 2003 - give numbering).

There was no consensus regarding the ideal duration of application. Most of the therapists felt that it entirely depended on the game as well as on the coach and the time that is provided to the physio to attend to the injury. The responses varied from duration of ten minutes to twenty and thirty minute applications. There is insufficient literature to support an optimal dose of cryotherapy. An intermittent ice application of 10 minutes is equally beneficial as a 20 min continuous application (Bleakly et al., 2006- give numbering). There were considerable differences that we found in the frequency of treatment. A previous research had reported (Beth L. Atnip and Jean L. McCrory, 2004- give numbering) that intermittent icing in between events should be undertaken in acute sports injuries. There was no agreement on the

optimal frequency of treatment. Few of the therapists advocated the use of every 2 hourly treatments for the first 24 to 48 hours while the others felt that a 4 hourly shot of cryo was sufficient to produce an effect. Beth (- give numbering) in his study reported significant improvements with 4th hourly administration of cryotherapy. Therapists felt that prolonged icing would evoke the Lewis hunting reaction which is definitely not the aim in acute trauma, however reactive vasodilation sets in only after 20 min of cold pack application (Craig Taber et al., 1992- give numbering) . Ten minutes was the ideal time for the numbness to set in and for the athlete to be put back into the game. A lot depends on the nature of the game, wherein the therapist may not get sufficient time for cryo applications. In such situations therapists feel that the player may be called out of the game in order to nurse his injury. One of the therapists (put reference with numbering) mentioned that the decision making factor would be the presence of subcutaneous fat as in obese individuals which would warrant an ice application beyond 15 min to achieve significant cooling.

Therapists quoted direct application of ice as a contraindication mainly due to the resulting vasoconstriction may enhance pain. So ideally ice needs to be applied with a towel or in a simple polythene bag and then applied over the part. Ice massage seems to have an additional effect on delayed onset muscle soreness. Standard text book contraindications include application of ice over areas of sensory deficit, hypersensitivity to cold, care while applying to the upper extremities which were also found in our survey. Open injury was also considered as one of the major contraindications. Few (Put reference with numbering) therapists felt that in open injuries cryotherapy can be used to reduce the bleeding. Few even practiced dressing the wound prior to the application of ice to the part. In events like boxing where open injuries are quite common cryotherapy is extremely useful in reducing the edema and the bleeding. Standard assessment like sensory evaluation before application of any modality may not be possible in a sporting field so most of the occasions the therapist will have to blindly go ahead with the use of this popular modality.

When asked about whether cryotherapy was part of chronic injury management, 57.5% of the therapists did not feel the need to apply ice on chronic injuries. The effectiveness of ice in the management of post surgical cases is well established (Lucy A. Lessard et al., 1997 - give numbering). Cryotherapy has significant contributions in reducing joint effusion and prevent muscle inhibition and facilitate the motor neuron pool (J Ty Hopkins et al., 2001- give numbering) .cryotherapy in post acute rehabilitation can minimize swelling before the commencement of exercises (Debra J. Cote, 1998 - give numbering) . 47.5% of the therapist strongly felt that ice could be used in chronic injury management especially for post surgical cases eg: post op ACL injuries. This may be the time when cryokinetics and cryostretches come to play where the patient will be able to better tolerate the rehabilitation procedures after the application of ice.

CONCLUSION

This survey found that cryotherapy was considered superior to the other modalities. The reasons which were quoted were mainly its effectiveness, portability, and the patient satisfaction which affects the outcomes. Cryotherapy as a modality is simple and economical and is most often the modality at hand for a physio who works for a state level team. The added advantages of cryotherapy over taping stands undisputed since it causes instant reduction in pain and is easy to apply. Taping on the other hand requires skill and is expensive. The role of taping in the prevention and treatment of sports injuries has been questioned over the years. The role of taping as an adjunct is an added tool when the athlete enters into a well structured rehabilitation protocol. As far as the initial management of any soft tissue injury cryotherapy is the primary modality.

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