Warm up

The issue is full of dreams and nightmares. If television coverage and Olympic participation are the criteria for acceptance as serious sport, then sport for the disabled has arrived. The sight of wheelchair athletes whizzing around the stadium in Atlanta must have thrilled disabled athletes everywhere. It must have been equally exciting for Cairbre McCann who was involved at the very beginning in establishing the classification of disabled athletes. A dream come true. Many believed creatine would be the answer to fatigue but it seems that dream is not quite what we believed. We have other dreams; that sport can help cure the social ills of society; that we can avoid serious head injury in contact and combat sport; that the preseason medical can detect important problems; that stretching can reduce muscle stiffness. Tread softly.

And the nightmares. Disaster struck the British team at the World Junior Rowing Championships where almost all got diarrhoea. Athletes were ill, performances suffered, and years of preparation were wasted. Everyone who has ever acted as a team doctor will shudder at the thought. Yet it could happen to us all and how many of us would be as well prepared or as able to cope. Gender testing may bring other nightmares. The psychological and social consequences to an athlete of failing a gender test are enormous. Science is improving but our understanding has changed. Unfortunately we cannot undo the harm done to those who may have been unfairly disqualified in the past.

And there is another nightmare. Sport for children should be full of laughter, fun, and enjoyment. There is not much of this in the piece entitled “I was that child.” The message is strong and the author wanted to shout it from the rooftops. The cloak of anonymity was our decision.

Child abuse in sport

Child abuse also occurs in sport. We may be shocked, horrified, and embarrassed, but it happens. On reflection, it is perhaps not surprising when we consider the opportunity for unsupervised contact with young children but it is a betrayal of trust that can have devastating and lasting effect. Children in sport are open to both physical and emotional abuse, but recent events have focused our attention on the even more emotive issue of child sexual abuse (see p364).

Sport offers a potentially high risk environment. The care of children is entrusted to coaches, officials, development officers, helpers, and other adults who may not be well known to parents. In training, there can be close contact in teaching technique and free access to changing facilities. Coaches or other adults may also be involved in transport to and from training and, as young athletes become successful, they travel to events and training camps further afield with relatively little supervision. Parents have the best interests of their children at heart when they encourage this involvement in sport and they may allow almost unlimited access to a coach or official who appears to recognise special talent or ability in their child. How is a parent to know the difference between a dedicated and inspirational official who takes a personal interest in their child from a potential abuser?

An abused child is in a very difficult position with many conflicting emotions and loyalties.

To a child the coach or official is a very important figure, a mentor, father figure, and authority. They may pick the team, set the training, and have a major influence on their success in the sport. Children also see how their parents react to, and often bow to, the wishes of these officials or coaches, so they may perceive them as a higher authority than their parents. There is a huge conflict of emotion when a person of importance, influence, and authority does something which they recognise as inherently wrong. And in most cases of child abuse, the victim feels guilty that it is their fault in some way.

The climate has changed for those who are genuinely interested in promoting and encouraging sport for children, either as teachers, coaches, or voluntary workers. Not only should they be aware of the potential for abuse by others but they must also protect themselves. There are important ground rules and they should ensure they are not regularly alone with any child, nor do anything or say anything that could be misinterpreted. Adults can inadvertently leave themselves open to accusation and the mechanisms of child protection are such that the stigma of the accusation, even without foundation or substance, will have a major impact on their personal and professional life. An adult involved with children in sport can never be too careful.

The medical professions have an additional responsibility, which is our duty of care towards children who may be at risk, and an obligation to be acutely aware of any possible accusations. It is a very brave child who seeks help formally and we have a duty to listen. Informal ripples of suspicion are usually the first indication that something is amiss and can easily be dismissed as insignificant and unsubstantiated gossip. Children, however, seldom initiate malicious gossip and they are often quick to sense when things are not as they should be. Rumours may be kept initially among themselves at pool or trackside, but hints or comment that are overheard should raise suspicion. It is easy to dismiss these as idle gossip, and indeed at times this may seem the easier option, but we have a duty to listen and report any concern. The issue of child abuse in sport may also place medical personnel in a particularly challenging position. The relationship with the child, parent, coach, and management can be complex and quite different from the normal professional relationship with possible additional
The National Coaching Foundation is also organising a nationwide series of workshops to raise awareness following on from the publication of this leaflet. We can only hope that a frank and open discussion, and setting out the steps necessary to protect children and officials, will help prevent the problem in the future.

DOMHNALL MACAULEY


Creatine supplementation: recent developments

It is generally accepted that the development of fatigue during short lasting maximal exercise in man is at least partly the result of the inability of phosphocreatine (PCr) hydrolysis to maintain a high adenosine triphosphate:adenosine diphosphate (ATP:ADP) ratio, due to PCr depletion. Evidence in support of this line of thought comes from animal studies showing that complete pharmacological depletion of PCr can substantially impair muscle force production1 and from human studies showing that the extent of PCr resynthesis during recovery following a bout of maximal exercise is positively correlated with exercise performance during a subsequent bout of exercise.2

The general idea that fatigue during maximal exercise may be related to the failure of skeletal muscle to maintain an adequate rate of ATP resynthesis as a result of PCr depletion led to the idea that oral creatine supplementation may be an effective strategy to increase muscle PCr and creatine (total creatine) concentrations and, thereby, exercise performance during single and repeated bouts of maximal exercise in man.3 This idea is not new; studies earlier this century reported that the development of fatigue during exercise in man could be delayed by the addition of large amounts of glycine to the diet. It was hypothesised that, since glycine is a creatine precursor, glycine ingestion would stimulate creatine biosynthesis and as a result increase muscle creatine concentration and thereby improve exercise performance. However, it has also been known for some time that creatine is present in the diet of meat eaters and that oral ingestion of creatine per se can substantially increase the whole body creatine pool, the majority of which is “trapped” in skeletal muscle.1

In 1981, Sipila et al4 reported that in patients receiving 1.5 g of creatine/day as a treatment for gyrate atrophy there was a subjective increase in strength and a reversal of the type II muscle fibre atrophy associated with this disease following a 1 year period of supplementation. More recently, creatine supplementation has been shown by several laboratories to have a positive effect on short lasting maximal exercise performance.5 In accordance with this, recent work indicates that creatine supplementation mediates its performance enhancing effect by increasing PCr availability principally in fast twitch muscle fibres.6 This finding is in agreement with published work suggesting the depletion of PCr specifically in fast muscle fibres limits exercise performance during maximal exercise,7 and with the hypothesis that PCr acts as a temporal buffer of cytosolic ADP accumulation in this fibre type during exercise.

In the majority of exercise performance studies to date, subjects have ingesting a dose of 20 g of creatine on a daily basis for five to six days. This regimen was based on the work of Harris et al8 which was shown to result in a ~25 mmol kg dry mass (dm) increase in muscle total creatine concentration with the between subject variation, however, being rather large (range 2-40 mmol kg dm). Since this initial study, data have been published concerning the most appropriate procedures to maximise muscle creatine uptake in man.9 Indeed, in agreement with Harris et al, it would appear that a rapid way to “creatine load” skeletal muscle in man is to ingest 20 g of creatine for five to six days. The increase in tissue creatine concentration achieved can then be maintained by ingesting 2 g per day thereafter. Alternatively, the ingestion of 3 g of creatine per day over a minimum period of four weeks is likely to be as effective as raising tissue levels as the higher dose regime, albeit at a slower rate.

As already mentioned, the extent of muscle creatine retention during supplementation is variable between subjects. The combination of results from several studies undertaken in our laboratory over recent years has revealed that ~20-30% of individuals “do not respond” to creatine supplementation, that is, they show less than a 10 mmol kg dm (8%) increase in muscle total creatine following five days of 20 g per day oral creatine supplementation (4 × 5 g doses dissolved in ~250 ml). Furthermore, it would appear that the positive effect of creatine supplementation on postexercise PCr resynthesis is not apparent if the magnitude of muscle creatine accumulation is less than 20 mmol kg dm. Obviously, these findings have important implications for athletes wishing to gain benefits from creatine supplementation. Indeed, more recent work has revealed that the magnitude of improvement in exercise performance following creatine supplementation is also closely related to the extent of muscle creatine accumulation during supplementation.10 Hopefully, these findings will provide some insight to those athletes who have “unexplainably” gained no benefit from creatine supplementation.

While it is clear that there is considerable variation between subjects in the extent of muscle creatine accumulation during supplementation, it has also be-