Reflex Sympathetic Dystrophy after Routine Venipuncture

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Reflex sympathetic dystrophy, a well-recognized disorder in adults, is uncommon in a pediatric population. Most cases are reported following minor trauma, typically sprains and fractures. To the best of our knowledge this is the first reported case of RSD following venipuncture in a pediatric patient.

RSD = reflex sympathetic dystrophy

Patient Description

A 15 year old previously healthy girl was admitted to our emergency room complaining of severe pain, numbness and cold sensation in her left hand. On the day of referral she had undergone a routine venipuncture for the purpose of evaluating liver function tests because of prolonged treatment of acne with isotretinoin (Roaccutane®). She had been undergoing these tests on a monthly basis. A routine venipuncture in her left cubital fossa was performed. Twenty minutes later she complained of a sharp, abrupt pain in the venipuncture area. During the following hours the pain moved distally towards her palm and proximally to her shoulder. The girl also described a sensation of numbness of the entire left upper limb. On admission her temperature was 36.7°C,

pulse 88 beats per minute, blood pressure 144/85 mmHg in her left arm and 126/81 mmHg in her right arm. Her entire left upper limb was cold, mildly cyanotic, and minimally edematous. She had allodynia. Her brachial, radial and ulnar pulses were normal. Gross motor strength of her proximal and distal muscles was 4/5. Skin sensation was normal. There were no other abnormal findings on physical examination. Her affect was normal, as was her psychosocial state. A clinical diagnosis of reflex sympathetic dystrophy was reached.

During the subsequent days there was no improvement following treatment with non-steroidal anti-inflammatory drugs, several courses of warm water soaking of the hand, and physical exercises. An arterial and venous Doppler study was normal. During that time the area of the allodynia remained grossly unchanged.

At home the patient continued with daily physiotherapy (without hydrotherapy), but without improvement. A therapeutic trial with nifedipine [1] was unsuccessful, and the drug was discontinued. Gradual improvement was seen after 27 days, but mild symptoms persisted for the entire follow-up period of 24 months.

Comment

Reflex sympathetic dystrophy is a poorly understood condition. Sudeck first described the condition in 1900 [2], although some years earlier other authors had provided the first clinical descriptions of causalgia, post-traumatic rarefaction of bone, and osteoporosis, following a long-standing painful sprain of the ankle. RSD is characterized by refractory pain, swelling, and limitation of movement of an extremity after trauma, which is usually minor.

Classical RSD is described in adults as occurring in three phases. The onset may be a few minutes after the trauma, or it may occur hours, days or even weeks later. In this phase increased blood flow to the site of injury makes the skin warmer. Increased growth of hair and nails may also be seen in that phase. The second stage is the dystrophic phase, which is characterized by cold intolerance and hyperesthesia. The pain is constant and disproportionate to the degree of injury, and is aggravated by touch or even emotional distress. The atrophic phase is the third stage, characterized by muscle wasting, loss of strength and contracture. The general awareness of RSD is still poor, because, on average, 30 months elapse until patients are admitted to a pain center for adequate therapy.

Treatment of RSD can be categorized as three-pronged: pharmacologic therapy, interventional therapy at the sympathetic nervous system, and physical therapy. Only few evidence-based treatment regimens for RSD are available. The treatment requires a multidisciplinary approach including neurologists, anesthesiologists, orthopedic specialists and psychologists.

RSD has been reported in children, mostly in teenagers, but also in the first decade of life. The reason for the rarity of this syndrome in a pediatric population is under debate. Whether it is the result of misdiagnosis by pediatricians who are not familiar with it, or whether it is a reflection of its true prevalence in children has yet to be determined.

In contrast to adults, trophic changes are rare in children [3,4] and recovery can be expected, if it occurs. The prognosis in children is reported to be much better than in adults [5]. Due to its fair prognosis this syndrome in the pediatric population should be treated conservatively, mainly with physical therapy and hydrotherapy [4].

Our patient exhibited most of the classic features of childhood RSD, although, unlike most pediatric patients, full recovery was not achieved even after 24 months. To the best of our knowledge, this is the first published case of RSD following routine venipuncture in a pediatric patient [5]. It demonstrates an overwhelming sympathetic reaction to relatively minor trauma. Physicians and pediatricians should be aware of this unique phenomenon, which may occur even after a repetitive routine procedure.

References

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Capsule

Stem cell go home

The efficiency with which hematopoietic stem cells (HSC) home to the bone marrow is a critical factor determining clinical outcome in transplantation. Christopherson II and colleagues show that efficiency of stem cell homing can be significantly enhanced by interrupting the activity of a peptidase, CD26, on the donor cell surface. Under normal circumstances, CD26 appears to negatively regulate HSC homing by cleavage of the chemokine CXCL12, thereby preventing binding to its receptor on the surface of HSC. The potential ability to increase the efficiency of HSC homing rather than having to isolate greater numbers of the stem cells may help bone marrow transplantation.

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