



Original article

Clinical characteristics of reflex sympathetic dystrophy in Aragon (Spain). A prospective study of 171 patients

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ABSTRACT

We followed a total of 171 patients diagnosed with Reflex Sympathetic Dystrophy (RSD). This enigmatic condition normally has a secondary origin, being trauma the unleashing cause in most cases. Psychological predisposition plays a major role in developing the clinical state, which affects lower extremities more frequently. In this series, patients were first seen during the acute “warm” phase and the final outcome was generally good after a period of treatment with non-steroidal anti-inflammatory drugs (NSAID), calcitonin and physical therapy. However, a comprehensive review of the literature revealed the heterogeneity of this condition.

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Estudio descriptivo y prospectivo de 171 pacientes con distrofia simpático refleja en Aragón (España)

RESUMEN

Hemos estudiado una población de 171 pacientes diagnosticados de distrofia simpático refleja (DSR). En esta población la DSR tiene, en gran medida, un origen secundario, siendo el traumatismo el más frecuente. El terreno predisponente más habitual es el psicológico. La DSR predomina en las extremidades inferiores. La mayor parte de las DSR han llegado en fase caliente. En general, la evolución ha sido satisfactoria con AINES, calcitonina y rehabilitación. En suma, nuestro estudio pone de manifiesto la gran heterogeneidad de este síndrome.

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Introduction

This condition has had many names over time, although the most commonly used have been algodystrophy and reflex sympathetic dystrophy (RSD).¹ Nowadays, it is known as complex regional pain syndrome type 1, the name proposed in 1994 by the International Association for the Study of Pain.^{2,3}

The number of different names it has acquired suggests a lack of understanding of many of its pathogenic aspects. From an etiological point of view, various predisposing and precipitating factors are recognised, although in some cases it has no apparent cause.^{4–6}

Clinically, it is usually present with pain, inflammation, vasomotor changes and functional deficit; all of these are more evident in its warm phase and at distal locations. It can sometimes evolve into a cold phase which brings with it trophic changes.^{1,7}

Diagnosis is based on different proposed criteria, Doury's classically being the most widely used.⁸ Nevertheless, other examinations not included in the criteria, such as 3-phase bone scans and MRI scans, may be useful for diagnosis.¹

Treatment should be initiated as early as possible and be based on rest, pharmacological treatment and rehabilitation. In the most exceptional and stubborn cases, regional sympathetic blocks are resorted to, via drugs or surgical means. Evolution is usually favourable, although sequelae (chronic pain, articular stiffness and soft tissue retraction) can persist in some cases.

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Table 1
Doury's diagnostic criteria

| | |
|---------|---|
| Group A | |
| 1 | Localised mechanical, inflammatory, or mixed pain |
| 2 | Cutaneous hyperaesthesia |
| 3 | Vasomotor alterations: localised hyper- and hypothermia |
| 4 | Modification of the integument: redness, pallor, or localised cyanosis |
| 5 | Localised hyperhidrosis |
| 6 | Localised oedema |
| 7 | Fascial or tendon retraction |
| Group B | |
| 1 | Localised homo- or heterogeneous bone demineralisation without osteocondensation or alteration of the interline |
| 2 | Hyper- or hypo-uptake on the bone scan |
| Group C | |
| 1 | Absence of biological signs of inflammation (Normal ESR) |
| Group D | |
| 1 | Non-inflammatory articular fluid |
| 2 | Synovial histology with evidence of vascular congestion and without inflammatory infiltrates |
| 3 | Normal bone histology or with rarefaction of the trabeculae or with osteoclastic or osteoblastic hyperactivity |
| Group E | |
| 1 | Spectacular effectiveness of calcitonin, beta-blockers, or sympathetic blocks |

Certain diagnosis: 1) at least one criterion from each of groups A, B, and C; 2) at least one criterion from each of groups A, C, and E.

Probable diagnosis: 1) 1 criterion from each of groups B, C, and D; 2) 2 criteria from group A and at least one criterion from groups C and D; 3) 2 criteria from group A and the criterion from Group E.

Possible diagnosis if a criterion from each of the double groups A and B, A and C, A and E, or B and C.

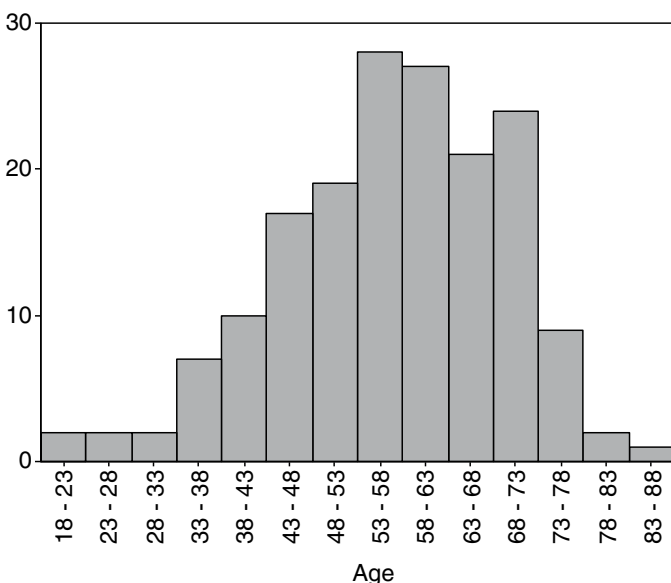


Figure. Distribution of our population as a function of age.

The aim of this study was to present the characteristics of RSD in a broad series, to try and shed more light on the understanding and diagnosis of this enigmatic syndrome. In the discussion, we also compare these results with those from the most representative works in the field.

Patients and methods

We conducted a descriptive, prospective study of a population of 171 patients, collected by various rheumatologists at the Miguel Servet Hospital in Zaragoza and in private practice, over a period of 10 years.

All patients were selected on the basis of meeting the Doury criteria (Table 1). Any patient displaying an increase in inflammatory parameters upon analysis or with a previous diagnosis of chronic inflammatory arthropathy was excluded.

A previously established protocol that assessed antecedents and different parameters (clinical, analytical, imaging techniques, treatment, and evolution) was applied to each patient.

Statistical treatment of data was performed with the SPSS package for Windows.

The study protocol was approved by the relevant local ethics committees following Helsinki Declaration guidelines.

All patients included in the study received sufficient information and gave their informed written consent to participate in it.

Results

Our population showed a slight predilection for RSD in females (56.1%). The age of our patients ranged from 19-86, with a mean age of 56.3 (Figure).

The predisposing circumstances of RSD in this study are reflected in Table 2. Precipitating causes of RSD were found in 70.2% of cases, as broken down in Table 2. However, no causes were detected in 29.8% of cases.

Interestingly, if we consider the precipitating cause and localisation variables we find the following: trauma of the hand/wrist (73.1%), foot/ankle (47.7%) and knee (42.9%) were particularly prevalent as a precipitating cause of RSD. Surgery was mainly responsible for RSD

Table 2
Predisposing and precipitating factors of RSD

| Predisposing and precipitating factors of RSD | No. of patients (%) |
|---|---------------------|
| <i>Predisposing factors</i> | |
| Anxiety-depression | 43 (25.1) |
| Hypertriglyceridaemia | 19 (11.1) |
| Diabetes mellitus | 18 (10.5) |
| Antecedents of RSD | 9 (5.2) |
| Hyperuricemia | 7 (4.1) |
| Alcoholism | 4 (2.3) |
| <i>Precipitating factors</i> | |
| Trauma | 77 (45.0) |
| Cast immobilisation | 42 (24.6) |
| Surgery | 32 (18.7) |
| CNS pathology | 8 (4.7) |
| Barbiturate intake | 4 (2.3) |
| PNS effects | 3 (1.8) |
| Pregnancy | 3 (1.8) |
| Heart disease | 1 (0.6) |

CNS, central nervous system; PNS, peripheral nervous system; RSD, reflex sympathetic dystrophy.

Table 3
Clinical and imaging features of patients

| | No. of patients (%) |
|--------------------------------|---------------------|
| <i>Localisation</i> | 171 (100) |
| Foot/ankle | 86 (50.3) |
| Hand/wrist | 26 (15.2) |
| Knee | 21 (12.3) |
| Shoulder/hand | 20 (11.7) |
| Hip | 13 (7.6) |
| Shoulder | 5 (2.9) |
| <i>Clinical</i> | 171 (100) |
| Oedema | 145 (84.8) |
| Hyperthermia | 108 (63.2) |
| Excessive sweating | 69 (40.4) |
| Redness | 68 (39.8) |
| Hypothermia | 22 (12.9) |
| Soft tissue retraction | 16 (9.4) |
| <i>Radiology</i> | 171 (100) |
| Heterogeneous demineralisation | 84 (49.1) |
| Homogeneous demineralisation | 62 (36.3) |
| Mixed demineralisation | 8 (4.7) |
| Normality | 17 (9.9) |
| <i>Bone scan</i> | 151 (100) |
| Hyper-uptake | 151 (100) |

localised in the knee (33.3% of cases/knee arthroscopy) and cast immobilisation, in large measure, of RSD in the hand/wrist (50% of cases). CNS pathology was especially present in 30% of shoulder/hand cases and heart disease in 20% of RSD of the shoulder. Barbiturate intake lead to 1 RSD of the shoulder and 3 of the shoulder/hand, all of these localised on the left side. Pregnancy was involved in 2 RSD cases in the hip and 1 in the knee.

The localisations of our RSD cases are distributed as shown in Table 3. Localisation of the shoulder/hand, foot/ankle, and hand/wrist were considered. There was a slight tendency towards the right side (54.4%) versus the left (40.9%) and bilateral effects (4.7%) in the following localisations: shoulder/hand, knee, and foot/ankle.

The time between onset of symptoms and the precipitating event varied between 1–210 days, with a mean of 19.3 days. The time of evolution between the onset of symptoms and the patient being seen in the Rheumatology clinic varied from 1–146 days, with a mean of 103.5 days (3.4 months). The highest mean time of evolution was for the hand/wrist (126.8 days) and the lowest was for the shoulder (48.2 days).

In our population, the appearance of symptoms was usually progressive (68.4%), while the intensity of pain was moderate (64.9%) and predominantly of a mixed type (mechanical and persisting at rest) (67.3%). Oedema was present in a majority of cases (84.8%), particularly in distal forms (foot/ankle–96.5%, hand/wrist–92.3%, knee–90.5%, and shoulder/hand–90%). There was presence of hyperthermia in 63.2% of cases, excessive sweating in 40.4%, and cutaneous redness in 39.8%. Likewise, the above clinical signs tended to be present in distal localisations. Alternatively, and suggestive of a cold phase, hypothermia was detected in 12.9% of cases and soft tissue retraction in 9.4% (shoulder/hand, hand/wrist, foot/ankle and knee) (Table 3).

Table 4
Treatments received by patients

| Treatment | No. of patients (%) |
|------------------------------|---------------------|
| <i>Physical treatments</i> | |
| Joint rest | 170 (99.4) |
| Rehabilitation | 133 (77.8) |
| Contrast baths | 36 (21.1) |
| Physiotherapy | 31 (18.1) |
| Occupational therapy | 1 (0.6) |
| <i>Symptomatic treatment</i> | |
| Calcitonin | 133 (77.8) |
| NSAIDs | 99 (57.9) |
| Prednisone | 52 (30.4) |
| Minor analgesics | 31 (18.1) |
| Gabapentin | 15 (8.8) |
| <i>Other treatments</i> | |
| Resting orthosis | 5 (2.9) |
| Guanethidine block | 1 (0.6) |
| Sympathectomy | 1 (0.6) |

There was a limitation of joint mobility in 76% of cases. This was shown in 100% of shoulder, shoulder/hand and hip localisations and, to a lesser degree, in the knee and foot/ankle (66.7% and 65.1% respectively).

The dystrophy was monotypic in 80.1% of cases and polytypic in 19.9%. For the polytypic cases, it was simultaneous in 16.4%, additive (one focus was extinguished only for another to commence in the same place) in 2.9%, and migratory (one focus was extinguished and, after a time, another appeared) in 0.6%. Specifically, the hand/wrist was always monotypic, whereas the RSD was polytypic in 1 case of the hip (simultaneous), 8 cases of the knee (6 simultaneous and 2 additive), 5 cases of the foot/ankle (3 simultaneous, 1 additive and 1 migratory), and 20 cases of the shoulder/hand (100% by definition) (90% simultaneous and 10% additive). We note that the simultaneous polytypic forms displayed a certain preference for bilateral localisation.

We encountered other clinical forms in our study: partial (1.2%), “infra-radiological” (9.9%), and recurrent (5.2%); not parcelled or “infra-clinical” forms were observed. To this end there were 2 partial forms (1 knee and 1 foot/ankle) and 17 “infra-radiological” forms (5 hand/wrist, 2 hips, 1 knee, 6 foot/ankle, and 3 shoulder/hand). RSD was recurrent in 9 cases (5 foot/ankle, 2 hip, and 2 knee). More precisely, 5 were in situ and 4 in another location.

All of our patients by definition displayed an absence of inflammatory parameters in the analysis. Hypertriglyceridaemia was detected in 11.1% of cases, diabetes in 10.5%, and hyperuricemia in 4.1%.

The radiological behaviour of our RSD cases is broken down in Table 3. In terms of localisation, heterogeneous demineralisation displayed a preference for the knee (76.2%), the hand/wrist (57.7%), and the foot/ankle (51.2%), whereas the homogeneous form was

found most in the shoulder (80%) and the hip (53.8%). Homogeneous demineralisation was also predominant in the bilateral forms (44.1%). There was no predilection in terms of bilateralism where demineralisation was mottled or mixed or normal radiology existed.

In every case where a bone scan was performed (151 patients), hyper-uptake of the product in the affected joint was detected, without encountering hypo-uptake forms (Table 3).

Five patients underwent a CT scan (2 hips, 2 knees and 1 foot/ankle) and 13 an MRI (3 hip, 4 knee, 5 foot/ankle, and 1 shoulder). In each case, the CT and MRI scans were requested to establish a differential diagnosis.

Patients had arrived with another diagnosis in 25.1% of cases, particularly with regard to hip locations.

The different treatments used in our population are detailed in Table 4.

Overall recovery time varied between 30-730 days, with a mean of 154.4 days (5.14 months). The longest mean was for the knee (232.2 days), while the shortest was for the shoulder (60 days).

The majority of patients (97.1%) had no sequelae. However, there were sequelae in 4 cases (2 foot/ankle, 1 hand/wrist, and 1 knee), these being mild mechanical pain on loading the knee and feet/ankles and a slight retraction in the hand. One patient died from ovarian neoplasm. Lastly, 24.5% of the patients were lost to monitoring for unknown reasons.

Discussion

The preference of RSD for a particular gender remains uncertain. The slight tendency towards females found in our study is very similar to that reflected by other authors.^{9,10} However, the predilection for females was more pronounced in other studies, ranging between 62.5%-75%.^{7,11,12,15} In contrast, in the wide-ranging, classic series by Doury¹³ and Eulry,¹⁴ males were slightly predominant, suggesting that this was due to their greater predisposition towards trauma. Lastly, a study undertaken by the French Society of Rheumatology on 573 people¹⁶ found no difference between the sexes.

The mean age, 56.3 years old (range, 19-86), of our patients was higher than that in the other series.^{9-11,13-15} In general, we believe that this difference may depend on chance in so far as those taking part in each study.

Racial differences were not considered as part of our work as they were not deemed relevant, bearing in mind that until recently the Spanish population was very homogeneous and essentially Caucasian. Few works have made reference to this issue^{7,11} and we therefore believe that the potential influence of race in the onset of RSD is unclear.

In our study, the most prevalent predisposing factor was anxiety-depression (25.1%), discovered on the basis both of documentation provided by the patients and their treatment. Although it is classically considered that an altered psychological state favours the onset of RSD,^{9,13,17,18} there are also authors who disagree.¹⁹ Nevertheless, other factors such as hypertriglyceridaemia¹⁴ have a major prevalence in other studies. It is worth noting that alcoholism is not usually named as a common predisposing cause of RSD; it was detected in 2.3% of our patients, compared with the 6% reflected in studies by other authors.^{13,14} Elsewhere, 5.2% of our patients had an antecedent of RSD, this being essentially localised in the foot/ankle. This antecedent was found in other series, in figures varying from 2%-13%.^{9,13,14,16} We can conclude that different authors agree on a common predisposing factor for the onset of RSD, although in varying percentages according to the population studied.

Finally, we considered it worthwhile to weigh up whether the predisposing factor determined localisation. It did not, except in the case of diabetes, which clearly favoured RSD of the shoulder

(40%) or a shoulder/hand syndrome (25%). This situation is one classically understood in rheumatology. It did not influence a preference for one side or the other, with the exception of the psychological factor, which predisposed towards bilateralism, to a greater extent.

The most relevant precipitating causes that we found (trauma, cast immobilisation, surgery, etc.), summarised in Table 2, are those usually reflected in the most representative works consulted on the matter,^{7,9-16,20-23} although with a certain variability in the percentages found. An unusual trigger in our study was the consumption of phenobarbital, which caused 1 RSD of the shoulder and 3 of the shoulder/hand, an issue classically described as Gardenal rheumatism in the French literature. We consider that this factor tends to be seen less when other drugs are used in anti-epileptic therapy. Similarly, pregnancy is rarely a trigger for RSD. We found 2 cases of RSD of the hip (a typical localisation for this field) and 1 of the knee. Specifically, this was 1.7% of the total compared with the 2.2% and 0.5% reflected by other authors.^{9,14} On the other hand, 29.8% of cases of RSD among our population were established as having no apparent cause, a figure higher than those of some studies (4.5%-20%)^{7,9,11} and lower than those found by others (37%-49%).^{14,15}

We also found that the precipitating factor did not noticeably affect right, left or bilateral localisation, except for surgery (which favoured a more pronounced bilateralism). We also found that RSD localised in the hip showed, to a large extent, an absence of an underlying cause in 69.2% of cases.

In short, the same reasoning could be made for the above as for the predisposing factors, as regards the presence of some common precipitating causes but in varying percentages depending on the different studies and their circumstances.

The localisation of our RSD cases is distributed as shown in Table 3. Certain potentially interesting points can be noted. There was a slight tendency towards the right side (54.4%) and a clear predominance in the lower extremities was observed.

Regarding the variables of sex and localisation, there was a clear preference in women for the shoulder (80%), the hand/wrist (69.2%), the shoulder/hand (65%), and the hip (61.5%). In contrast, the preference in men was for the knee (61.9%). In addition, bilateral and right side localisation was more common in women (75% and 60.2%, respectively). Mean age differed little between the hand/wrist, shoulder, knee, and foot/ankle, ranging from 51.2 years-59 years; it was earlier for the hip (44.8 years) and later for the shoulder/hand (62.2 years).

Comparing these results with those of other authors, we observe that some also found a predilection for the right side^{11,13} and others a greater preference for the upper extremities.^{10,16} In contrast, predominance in the lower extremities was observed in other studies,^{9,15} in line with that of our own.

From the above, it appears that there is a considerable disparity in results depending on localisation. It could be interpreted that these data are influenced by the different characteristics of the populations studied.

The onset time of the symptomatology with respect to the precipitating factor was on average 19.33 days, compared with 66.59 days as reflected in another study.⁹ This parameter was occasionally difficult to determine accurately for some patients and is often not reflected in other series.

The evolution time from the onset of symptoms until the patient was seen at the rheumatology clinic was a mean of 3.4 months. Some authors^{9,14,15} detail similar figures (3.1, 4.5, and 5 months, respectively); however, others contributed higher mean times.^{10,11} As an interesting sideline, Allen¹¹ estimated that before arriving at their pain unit, patients had been seen by a mean of 4.8 doctors and arrived with a mean symptom evolution time of 30 months (range, 2-168 months).

This evolution time is obviously fundamental to establishing an early diagnosis and, in turn, for the patient's prognosis. We understand this to be determined by the health infrastructure of each area studied, particularly by the family/rheumatologist or other specialists' medical cycle.

If we compare our results regarding the onset of symptomatology (form, intensity, and type of pain) with those of other studies, we observe a large variation.^{9-11,13}

Our findings regarding the presence of oedema, hyperthermia, excessive sweating, and cutaneous redness are presented in Table 3. Just as is discussed in the literature, these clinical signs were more prevalent in the distal localisations and in the warm phase. Similarly, the hypothermia and soft tissue retraction results that appeared, logically enough, in the RSD cold phase, are reflected in the table.

In general, the most relevant studies consulted in this context contributed results different both to ours and among themselves, possibly conditioned by the sample population and, particularly, by the evolutionary status of each RSD.^{9,10,13-15,25}

Overall, we found limited joint mobility in 76% of cases, a figure lower than that of other authors.^{9,10} Our results regarding the foot/ankle are similar to those found in other studies^{14,15} but when considering the knee, Doury observed limited mobility in 100% of RSD cases (66.7% in our study). We found no explanation for these differences.

Agreement was even harder to reach in the discussion of polytopic forms, these being less prevalent and less well studied.

If we contrast our findings on monotopic and polytopic (simultaneous, additive, and migratory) forms of RSD, detailed in the results section, with those described in the most significant works in this area, we see results of considerable diversity. While Allen¹¹ found polytopic forms in just 7% of cases, Gougeon¹⁶ observed them in 41.89% (more common in the lower limb) and on only 5 occasions (less than 1%) detected an impact on 3-4 limbs during the same crisis. The latter also discussed a relationship between a certain predisposing area and polytopic forms: psychological and, to a lesser extent, diabetic, hyperuricemic, intra-cranial lesions and barbiturate ingestion. Following on with important studies of these forms, David-Chaussé²⁴ described polytopic forms (40.1%) as being more common after the age of 60, these RSD cases usually extending to joints on the same limb or on the contralateral one but rarely to the upper or lower (only 5 cases in 573). David-Chaussé also found an impact on 3-4 limbs during the same crisis in 3.1% of cases and stated that psychological factors were present more frequently in polytopic forms (41.2%) than in monotopic ones (29.1%). Similarly, another 2 aetiologies largely related to polytopic forms were described: intra-cranial lesions and treatment with barbiturates. Finally, a retrospective revision of 28 polytopic RSD cases of the lower extremities²⁶ revealed the following results: 35.71% were simultaneous, 21.43% additive, 42.86% migratory (16.4%, 2.9% and 0.6% in our study), and in 6 patients the impact had extended to the upper extremities.

Summing up, this section on monotopic and polytopic forms reinforces the heterogeneity of this entity.

We will now emphasise, given their rarity, other clinical forms of RSD found in our population: recurrent (5.2%), partial (with impact on a wide articular area, for example a femoral condyle) (1.2%) and "infra-radiological" (with RSD symptomatology but without radiological alteration) (9.9%) (15 with a short evolution time/a mean of 35 days and 2 with long evolution and in the cold phase/a mean of 455 days). Our study did not find parcelled forms (focal impact on an articular area, for example on the femoral condyle) nor "infra-clinical" (with little symptomatology but with radiological demineralisation evident). In keeping with this, these forms are not often studied, although Doury¹³ observed 3.2% of partial RSD cases and 33.6% of parcelled cases in his series, localised on the knee.

In the related French literature, it is a classic to say that "RSD rarely retraces its steps". Nevertheless, there is occasional evidence of recurrence: we found it in 5.2% of cases (5 foot/ankle, 2 hip, and 2 knee). Of these, 5 were in situ and 4 in another localisation. We observed no notable differences in this presentation with respect to gender (5 women and 4 men), although an altered psychological state predominated in 5 cases of this form. Of the rest, one was diabetic, another had dyslipidemia, another was pregnant, and no predisposing factor of interest was found in another. These findings can be contrasted with Gougeon's¹⁶ interesting study which detected this recurrence in 2.4% of cases, the majority localised in the foot. He added that it had, to a minor extent, a background etiological context of classic RSD and also that no preference with regards gender was found. On the contrary, this author considered that the influence of psychological factors in this form of presentation was considerable (46.4%), higher even than that found in polyarticular forms (41.2%).

All of our patients by definition displayed an absence of elevated inflammatory parameters (ESR, PCR) in the analyses. Where this was not the case, the study was discarded. In this respect, our most significant findings have been outlined in the results.

The radiological behaviour of our RSD cases is specified in Table 3. It is apparent that radiological normality compared with the healthy side coincided with RSD that had an mean evolution time of approximately 1 month or that was already much evolved (2 cases with an mean of 455 days). This would be consistent with RSD of a short evolution and, therefore, without time to cause a radiological deterioration; or with the complete opposite. Meanwhile, the tendency to heterogeneous demineralisation in distal forms and to homogeneous demineralisation in the proximal, as established in our study, is in line with that usually described in the literature.^{13,14,16}

From this we can conclude that, unlike other parameters analysed in this discussion, radiological behaviour seems quite consistent across a number of studies.

We have already commented that bone scans showed hyper-uptake of isotope in the affected joint in 100% of our RSD cases (Table 3). We did not find any hypo-uptake forms, more characteristic of RSD in children.²⁷ Most authors have confirmed a tendency to hyper-uptake, ranging from 85.7%-96.9%,^{9,10,13-15} and some^{10,13-15} describe hypo-uptake cases in a range from 0.8%-9.6%.

We can therefore say that bone scan results are usually fairly uniform across different studies.

We again emphasise that only CT and MRI scans were used for establishing the differential diagnosis in certain localisations.

We considered it worthwhile to include in our protocol a section detailing whether patients arrived at our clinic with another diagnosis. This occurred in 25.1% of cases, particularly for localisations of the hip, followed by the foot/ankle. These other diagnoses included pain of unknown origin, non-specific arthritis, pain of traumatic origin, degenerative pathology, mechanical pathology (soft tissue, static), heel spurs, osteonecrosis, osteoporosis, radiculopathies, and rheumatic fever.

We did not find mention of this issue in the literature reviewed. It should be remembered that RSD requires differential diagnosis with traumatic, inflammatory, infectious, metabolic and vascular pathology, peripheral neuropathy, and simulation in its cold phase, among others.¹

Just as shown in Table 4, almost all patients rested the affected joint, complemented by pharmaceutical treatment in varying percentages (18.1% paracetamol, 57.9% NSAIDs, 8.8% gabapentin and 30.4% low dose corticosteroids/10 mg of prednisone decreasing progressively). The latter therapy is undertaken for RSD in highly inflamed peripheral joints. With regards to background treatment, calcitonin was used in 77.8% of cases because it was the standard drug employed for the RSD hot phase at the time patients were being gathered for the study.

Our patients were to a large extent (77.8%) referred for rehabilitation, 7.6% of these cases being preceded by an infiltration. Physiotherapy was also used in 18.1% of cases, occupational therapy in 0.6%, and contrast baths in 21.1%. This is usually standard practice for all medical professionals although, sometimes with a different distribution of therapies. Other professionals added magnetic waves or the wearing of an arch brace in bed to prevent retraction of the foot.

Elsewhere, more exceptional therapies were employed after the failure of conventional ones. Among these, 2.9% required a resting splint, 0.6% a guanethidine block, and 0.6% a sympathectomy, coinciding with cold phase RSD and soft tissue retraction. It should be pointed out that the need for sympathetic blocks in our study was less than that of other authors.

In short, it is clear that the same therapeutic arsenal is generally used for the treatment of RSD, albeit with different guidelines.^{9,14,15,25}

The recovery time of our population varied between 30-730 days, with a mean of 5.1 months. The longest mean was for the knee (7.7 months) while the shortest was for the shoulder (2 months). No notable differences were found for this parameter with regards to right, left or bilateral localisation.

Apart from our data, it is worth providing the findings of some other studies for a more precise picture of this important parameter. Iborra²⁸ estimated the mean RSD resolution time to be 4 months and suggested that the best progress is made during this period. Similar results were observed in a French series,⁹ with a mean recovery time of 4.5 months (1-13 months), longer for distal forms and RSD in the cold phase. Doury²⁹ also suggested a poor prognosis for RSD localised in distal areas. Eulry¹⁴ found a mean recovery time of 8.6 months for RSD of the foot, 75.5% of cases recovering inside a year. This time was increased for those patients with RSD and contributing psychological factors. Allen¹¹ also reported a long duration for certain cases of RSD of the upper extremities with the presence of a myofascial syndrome. Lastly, in Gougeon's¹⁶ series, the mean recovery time ranged from 3 months-3 years; 18%-19% were cured in at least 3 months and 56% at 9 months. Symptomatology persisted at 3 years, however, for 21.6% of cases. Gougeon added that the rate of recovery after a year was higher in monoarticular forms (61.9%) than in the polyarticular (50.9%).

Of the patients who remained in our study until the end of the process, 97.1% did not experience sequelae. However, there were sequelae in 2.3% of cases (2 foot/ankle, 1 hand/wrist, and 1 knee) (mild mechanical pain on loading the knee and feet and a slight retraction in the hand). One patient died as a result of ovarian neoplasm.

Some examples in the literature consulted also make mention of this issue. Eulry¹⁴ found sequelae in 4.02% of cases of RSD of the foot, manifesting as 2 cases of subaagalar "stiffness" and 6 soft tissue retractions. Bruscas⁹ observed a perpetuation of the process (patients with a problematic psychological context) in 4.5% (2) cases.

From the above, we can conclude that the worst prognosis is linked to RSD in the cold phase, in a distal localisation, and accompanied by a psychological component.

Finally, the impact of RSD on a patient's working life has been little discussed in the literature. For this reason, we shall comment on that which is most worth mentioning. In an interesting follow-up, Gougeon¹⁶ concluded that 36% of 210 patients had resumed work by the 5th month, 58.3% by the 9th month, 69.6% by the 12th month, and that at 3 years 13.8% had not been able to resume employment. Gougeon also found that sick leave was longest amongst women. Eulry¹⁴ compared the evolution of RSD in general (8.6 months) against RSD related to a work accident and found that recovery was longer in the latter context (9.7 months). In another interesting study, Allen¹¹ observed that 56% of patients associated

their RSD with work. This was most common among restaurant workers, bakers, and police, 54% of whom had made compensation claims in relation to their RSD and 17% of whom were involved in a lawsuit related to their RSD.

Conclusions

In our population, RSD largely had a secondary origin. Trauma was the most common of these, although in approximately one third of cases no known precipitating factor was detected. Factors that predisposed a patient to suffer from RSD were recognised, particularly a previous psychological or metabolic disorder. The disorder usually appears in middle age and is more prevalent in the lower extremities. The evolution of RSD was generally satisfactory with rehabilitation, NSAIDs, and calcitonin. Lastly, predisposing psychological factors, distal localisation, polyarticular forms, and a long evolution all result in a worse prognosis for RSD.

Conflict of interest

The authors declare no conflict of interest.

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