

Research Article

The Post-Polio Syndrome, Epidemiological Characteristics and Risk Factors in Algeria

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- PPS
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- Cold intolerance
- Obesity

Abstract

1.1. Introduction: The post-polio syndrome (PPS) is a clinical entity, appears at least 15 years after the acute phase of polio in the frequency of this pathology, it is over 20%. The management of the SPP remains outside any regimen well lit and codified. Our goal in this work is to identify the epidemiological including identifying risk factors.

1.2. Patients and methods: This is a descriptive study based on historical cohort of patients carried over from 2010 to 2013, made on 104 patients with acute anterior poliomyelitis sequelae. A listing review was developed with items in search of symptoms characterizing the post-polio syndrome (pain, fatigue and new muscle weakness ...).

1.3. Results: The prevalence of PPS in our cohort is 46. 31% of PPS-patients have an average grade. Sex is not a risk factor.

The important age group is that of 40-49 years, There remains no age in our cohort represents a significant impact to the PPS. In our cohort of polio the risk of having a PPS is almost tripled to an age in acute > 4 years with a significant difference. Obesity is present in 29% of PPS patients, and obesity is a risk factor for polio patients. Most PPS patients have monoplegia on the lower limbs. Functional assessment of the scale "MIF" Overall, in our PPS patients before onset muscle news, and at recruitment, rocking higher scores to lower scores but without statistical significance. The pain is almost present. The cold intolerance symptom, very present 90% especially in the lower limbs. We do not find significant figures related to cognition disorders, namely memory disorders.

1.4. Discussion: In our study, the prevalence of PPS is 46% (48 SPP / 104 Polios). This impact, more or less, high in Algeria, is probably related to a non-alerted medical community, disregarding. The age of onset of polio in our PPS population (Algeria) is 1 to 3 years.

This, would it be related to the type of attenuated vaccine used in Algeria (oral). The PPS age of onset is 42 years, is due to inadequate physical activity, or in connection with a bad assumption. A new muscle weakness is a critical symptom; our results are consistent with other series. The risk of SPP, among polio patients is multiplied by five when obese. The prevalence of pain in our sample is around 89.58%, which leads us to believe it is very present in PPS patients. We believe that this high rate may be related to a total disregard of the rules of hygiene of this syndrome.

Intolerance to cold was found in our PPS patients, and much more than in other series. It seems that this is a particulate of our population

1.5. Conclusion: The PPS is a clinical entity in itself, Think of the post-polio syndrome before: fatigue, new muscle weakness, muscle pain and / or joint. Seizing the risk factors that seem paramount. A study on the specific care needs of PPS patients is more than necessary for these patients.

INTRODUCTION

The post-polio syndrome (PPS) is a clinical entity, made of new symptoms (new paresis, fatigue, pain, muscle atrophy and cold intolerance) that appear remote, a few years of infection with poliovirus. This name was used for the first time in the international conference in 1984 at the Warm Springs Institute for Rehabilitation in Georgia.

In fact, at least 15 years of evolution after a poliovirus infection, new clinical signs appear. Charcot, in 1875 highlights a recurrence, which is made by muscle weakness, and it was not until 1985, the diagnostic criteria for post-polio syndrome

have been proposed by LS Halstead, validated by "the European Federation of Neurological Societies ". As to the frequency of this disease, neurological rather, it varies from 20% to 60% among polio survivors patients [1,2]. The diagnosis of post-polio syndrome is essentially disposal, which must remove all medical or surgical causes may be the source of this group of symptoms that are not specific to this particular clinical entity [3-5]. As to the frequency of this disease, neurological rather, it varies from 20% to 60% among polio survivors patients [6-8]. The management of the PPS remains outside any regimen well-lit and codified. Emerging drug treatments and topical show a slight pain relief, quality of life and muscle strength.

The physical medicine and rehabilitation is promising for these patients, more when combined with drug therapy, particularly intravenous immunoglobulin's to date used in clinical trials, and other future drug [9,10]. Algeria is also well-known by acute anterior poliomyelitis epidemics in the sixties. There were 4,000 polio survivors between the years 1963 and 1996 (Site: <http://www.ands.dz/insp/pev.htm>). Their support was often done in the hospital the time of referral, Tixeraine Hospital in Algiers. it should be noted that the most serious cases affected in the sixties, were transferred for care in France. As for post-polio syndrome, unfortunately, there is no epidemiological evidence or research on the reality of this disease in our country that can guide practitioners in their daily newspapers. This clinical entity has a strong socio-professional impact in particular on the quality of life; our goal in this work is to identify the epidemiological including identifying risk factors for Prevention of this syndrome.

PATIENTS AND METHODS

This is a scoping study over a period from 2010 to 2013 cohort kind, made of 104 patients with acute anterior poliomyelitis (AAP) sequelae exposed to submit a clinical entity called 'post-polio syndrome', this study is based prospective descriptive patient history.

A listing review was developed with items in search of symptoms characterizing the post-polio syndrome (pain, fatigue and muscle weakness news...).

Pain rating scales (VAS), muscle strength (Scale Muscular Testing), fatigue

(Borg Scale and Scale Pichot) as well as the quality of life and function (Scale of functional independence Measure MIF) were used during the study. Patients were examined at the consultation as available with the maximum of information gathering within the scope of items designed in established forms.

In need of electrophysiological explorations, radiological, and biological are required to identify the various signs to identify. The parameters and variables used in our study on the PPS are:

- **Component 1:** Marital Status and characteristics of the person with AAP sequelae, which are collected through an interview by a single practitioner through a questionnaire with: Age in year audited on an identity card.

- Date of recruitment and File No., telephone coordinated and exact address.

- Marital status and number of children in care.

- Profession and type of job.

- Mode and living conditions.

- The biometric factors.

- **Component 2:** The conditions and the occurrence of the AAP story in childhood, clinical para-clinical status:

- The age of onset of the PAA, surgical history related to AAP

- Medical history (the comorbidities).

- Skin-trophic status orthopedic patient, and the current

status paralytic.

- The type of equipment worn by the patient.

Component 3: PPS own clinical data to know :

- General weakness and loss of function.

- Pain: its type, mode, time delays, and location.

- Muscle weakness: the time of onset, muscles and affected members.

- Assessment of the functional state by the Scale MIF (transfer deals mobility locomotion in his items).

- Fatigue: the time of onset, type and its measurement through the Borg Scale and Scale Pichot and the notion of walking perimeter before the onset time, and now.

- Seeking cold intolerance, insomnia, depression and cognitive impairment including memory.

RESULTS

The prevalence of PPS in our cohort of polio patients is 46%. According to the criteria of Halstead muscle weakness is the main symptom associated with at least two other criteria to confirm PPS. This study determines the association (DLR + FM + FTG AMY + + IF) as PPS criteria characterizing our population with a prevalence of 73% (restriction combinations). 31% of PPS patients have an average grade, and only 10% were able to go to university level, 50% are married with family responsibilities, and 60% do not have a job. The male sex is predominant with a rate of 52.08%. Note that the risk of occurrence of the PPS, in our cohort of polio is almost doubled, any time we do not find a significant difference.

§ The important age group is that of 40-49 years. There remains no age in our cohort represents a significant impact to the PPS.

§ The age in the acute phase in our post-polio patients of 1-3 years is strongly present in 71.5%. Any time in our cohort of polio the risk of having a PPS is almost tripled to an age in acute > 4 years with a significant difference.

PPS: Post-polio syndrome FM: New muscle weakness DLR: pain FTG: fatigue AMY: atrophy IF: cold intolerance

The average BMI was estimated at 26.89 ± 5.47 , obesity is present in 29% of PPS patients, 23% have moderate obesity. The study of risk factors found that obese polio victims at risk multiplied by 5 to have a PPS. 52% have medical ATCDS which 16% have hypertension.

52% have a history of orthopedic surgery related to polio sequelae, 54% have suffered from tenotomies and 25% on their elongations was charged with MI. Only one patient in our series polio developed a PPS three months after spinal surgery for ovarian cysts.

Most patients PPS have monoplegia on the lower limbs, matched by a great walker in 40% of cases. Non-walking are rare in our sample, we believe our cohort is biased by a massive recruitment autonomous patients in the lower limbs. The functional status of scale "MIF" Overall, in our PPS patients

before onset muscle news on recruitment, rocking higher scores to lower scores but without statistical significance, by cons, about the item locomotion of the MIF there is a very significant switch to the lower scores in relation to the preponderance of violations MI. The pain is almost present, and the interval from onset of pain from polio onset is 36 to 45 years in 37% of cases, noted that the intensity is 4 to 6 of 45 in VAS scale % of cases. Present very cold intolerance symptom of 90% including the lower limbs. We do not find significant figures related cognition disorders, namely memory disorders, also with signs of depression.

DISCUSSION

The post-polio syndrome was recently individualized clinical entity. This syndrome is still being debated. In Algeria, Is it really in our polio patients? He is not a natural evolution of a flaccid paralysis? Or, on the contrary, is it a disease entity, well defined, clinically epidemiologically, and based on etiologic basis?

According to many authors including Anglo-Saxons, the PPS really exists. It is defined on purely clinical grounds. Its impact on quality of life was assessed using scales designed for other neuromuscular diseases. A deterioration of functional capacity was observed.

The objective of this work is to try to provide answers to questions while highlighting its importance and also to approach epidemiologically.

Our study population consists of 104 patients with an acute anterior poliomyelitis. The search for the PPS in our population polio, according to the diagnostic criteria according to Halstead, allowed us to identify some risk factors for this syndrome, factors included in our study.

In our study, the prevalence of PPS is 46% (48 SPP / 104 Polios, these results are similar to the Swedish study, the research team L. Werhagen [10], where the incidence of PPS was 50%. another prospective study similar to ours, the team of Paul E. Peach [11], reported an incidence of 41%. as against the impact of the PPS in France is 23% for A study, Yelnik [12].

(Table 1) reports the prevalence of various studies published to date (Med pub, direct science, Lincoln library, EM premium).

This impact, more or less, high PPS in Algeria, would it not related to:

§ A non-alerted medical community, disregarding.

§ Polio in Algeria population still young, active, misguided, and uninformed uneducated in terms of prevention and poorly manages the physical and psychological stress.

§ Therefore the stability period is not long maintained.

In our study the average age at the start of recruitment of our population is 40 years, while for the other studies, Canadian, Swedish, American, the average age of recruitment is more advanced. This is a notable difference, which can be related to North African countries in relation to climate and socioeconomic difficult conditions.

The age of onset of polio in our PPS population (Algeria) is 1 to 3 years with a frequency of 68.75%, whereas in Western

countries it rather occurs in children 6 to 9 years. Our results are similar with respect to the study of the Norwegian team K.S Sunnerhagen [13].

This, would it be related to the type of attenuated vaccine used in Algeria (oral)?, While developed countries, namely the Netherlands, Sweden, Finland, Iceland, Germany and France use in their immunization program, the injectable inactivated vaccine Jonas Salk since the fifties, which has not been used in the vaccination calendar in Algeria until 2016, and which generates a delay of contamination a decrease in the transmission, resulting in an acquisition delay of a natural immunity. Univariate comparative analytical study in PPS patients, looking for risk factors include the impact of the PPS in females at 39.66%, while in males, is 54.35%. The statistical test found an "Odd-ratio" of 1.8, indicating a high chance (almost double) to have a PPS in males than in females, but this OR value is not significant. Thus, the sex is not a risk factor occurrence of PPS in our study. Is it a recruitment bias compared to studies made in the USA, Norway, Canada Suede, where the female is considered a risk factor.

The age is it involved in the onset PPS? The average age in our series of PPS patients is 41.95 years \pm 11avec a range from 23 to 65 years, 50% are aged

Between 40 and 49 years (young people). While in the study of a Yelnik [12], the average age of PPS is 51 years, and the most of the studies found an average age higher beyond 53 years.

In Algeria, the PPS occurs in a young population, is this syndrome due to improper physical activity or in connection with a bad assumption in the absence of any preventive program (energy saving, a preventive physical maintenance program). Knowing that the analytical study has not shown that advanced age is a risk factor. A new muscle weakness is a key symptom for the diagnosis PPS according to the criteria of Halstead. For this, the appearance of this symptom period, from the first episode of poliomyelitis, is an important element to know, it is 32.7 years in our study.

The Canadian study by Daria A Trojan [17] it had advanced a result of 39 years, more or less; close to our results. Namely, in the USA study, the team of Paul E. Peach, [11] was 44.6 \pm 9.5 years. In Algeria, the time to onset of new muscle weakness, appears shorter.

Is it related to exposure to seasonal heat in our country for longer way; and degrees sometimes very marked in comparison to North America where the average temperature is cooler, or so our population ignorance of the PPS and the lifestyle rules, including the energy industry, is exposed to physical constraints?

Does Obesity represent one of the occurrence factors of PPS? The frequency of obesity among our 48 patients-SPP, was found in 29.1%. And mean BMI was estimated at 26.89 \pm 5.47. Our results are similar to the Brazilian study, J.V Bargieri [18], who found the average BMI 24.58 \pm 3.3. However the statistical study in the United States of Al Schuler Kevin E [19], of 443 PPS, found obesity in 32.7% of men and 29.8% women, which is very close to our results. Is it a setting favoring the appearance of the PPS in Algeria? Given that obesity is a contributing factor to many diseases in adults. Indeed, in the Univariate analytical study of

our sample, the incidence of obesity in patients-SPP (IMC ≥ 30 kg / m²) was 77.8%, against 39.5% of non PPS patients obese. There is a fivefold increase in the risk of PPS in poliomyelitis patients when there is obesity, and the relation is very significant, with “p” equal to 0.003 (Table 2) The pain is the second complaint in our post-polio population, it is either muscle, joint or mixed. The prevalence of pain in our sample is 89.58% Order (Figure 1), which leads us to believe it is very present in PPS patients. Our results are closer to the Swedish study team Lars Werhagen [12], which has a prevalence of 74%. We believe that this high rate may be related to a total disregard of the rules of hygiene of this syndrome.

The majority of our patients have paralytic infringements affecting mainly the lower limbs with a rate of 87.5% (Figure 2). Consistent with the results of the Swedish study Marita Widarqui [20] reported a 72% lower extremity.

Fatigue, first cause of consultation of the PPS, reported in our series at a rate of 93.75%. Two studies, Australian Mary T. Westbrook [21], and American Richard L. Bruno [22], found a frequency of 91%. With high levels of fatigue can be considered as the main symptom PPS.

The emergence of new amyotrophies, (Table 3) constant sign of the PPS, is found in all series with oscillating between 80% and 95%. It is 93.75% in our series Cold intolerance is due to vasomotor disorders, frequently found in our PPS patients; and many more in other series: 90% in our series, while it ranges between 30 and 67% for other series. Is this a peculiarity of our population, accustomed to our temperate climate warm even in some areas? Cognition disorders and depression are not part of the pathognomonic signs of the SPP itself.

Table 1: Prevalence of PPS in the different studies.

Author-year	Study type	(n)Popu- lation	PPS Frequency
Farbu E [14] 2004	prospective multicenter	144	11.8%
A.Yelnik [12] 2013	Rétrospective	200	23%
Lars Werhagen [15] 2013	Controlled Prospective monocentric	114	28.5%
Neil R. Cashman [16] 1995	experimental	18	20%
Paul E. Peach [11] 1991	Prospective	77	41%
Our study	historical prospective cohort	102	46%
L. Werhagen [12] 2010	Prospective	143	50%
K. S. Sunnerhagen [13] 2010	Prospective survey	186	65%

Table 2: Obesity and PPS.

Impact		P	OR	IC
Obesity		0,003	5,35	1,62-17,63
No	39,5%			
Yes	77,8%			

Table 3: New amyotrophies.

Series	(N)	Atrophy in%	Country
Our séries en 2013	48	93,75%	Alegria
Conde MTRP [23] 2009	132	93.6%	Brazil
Isabelle Leparc-Goffart [24] 1996	10	80%	France
Burk Jubelt [25] 1999	100	95%	USA

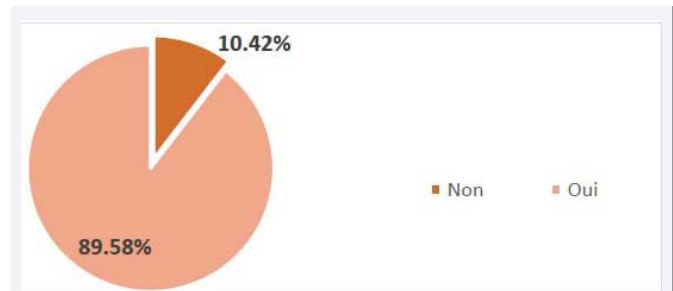


Figure 1 Prevalence of pain.

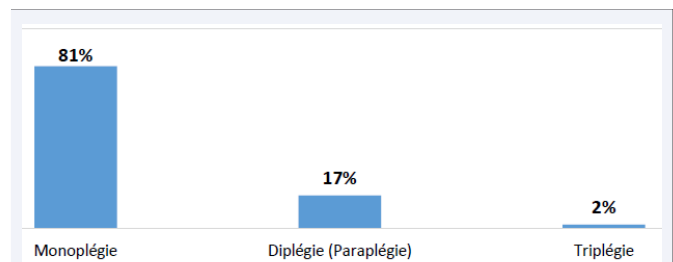


Figure 2 Type of paralysis.

CONCLUSION

The PPS is a clinical entity in its own, our results found an incidence of 46%, average age 41.4 years manifests and risk occurred of the SPP are: acute onset of polio beyond an age of 4 years and a BMI equal to or greater than 30. Think of the post-polio syndrome before: fatigue, new muscle weakness, muscle pain and / or joint, especially beyond 30 years of evolution of polio.

Seizing the risk factors that seem essential that the precocity of the initial damage polio, especially after the age of 4 in Algeria (p = 0.038), and obesity (p = 0.0036). We believe it is essential to include the current “post-polio syndrome” in medical graduation courses, not merely the study of acute anterior poliomyelitis only. The waning of this study, it seems necessary to make a study on the specific care needs of PPS patients. And finally it is better to invite guardianship “Ministry of Health Population and Hospital Reform” to recognize the PPS, for accreditation of this clinical entity, which would result in a validation of a specific compensation.

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