



AIDP BEFORE AND AFTER COVID-19 IN ALGERIA: SHORT COHORT STUDY

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ABSTRACT

Acute inflammatory demyelinating polyradiculoneuropathy is an immune-mediated polyneuropathy (AIDP) that manifests in the form of an acute, ascending, areflexic, progressive and symmetrical paralysis.

The primary infection usually from the respiratory or gastrointestinal tract and can be bacterial or viral, and during the pandemic SARS -COV2 and COVID-19 vaccine may also lead to it

Life-threatening complications can occur as a result of Acute inflammatory demyelinating polyradiculoneuropathy Syndrome, such as: Severe Autonomic Cardiovascular Dysfunction and respiratory distress.

We will report cases who were admitted to the ICU at Lamine Debaghine hospital between 2018 and 2023 presenting major complications and their evolution under ICU ward assistance.

CATEGORY: Resuscitation and Anesthesia, Emergency Medicine

KEYWORDS: *Acute inflammatory demyelinating polyradiculoneuropathy syndrome, dysautonomia, ICU, AIDP, Guillain-Barre.*

INTRODUCTION

acute inflammatory demyelinating polyradiculoneuropathy is an acute inflammatory and immune-mediated peripheral nervous disease (1).it is the most common cause of acute flaccid paralysis (1–2 per 100,000 person-year) (2)

Due to an Infection with organism contain amino acid that mimic peripheral nerve myelin, causing Edema and inflammation of affected nerves. The Immune system fails to distinguish between foreign proteins and nerve protein, as a result, we have a Demyelination of peripheral nerves lakes or absence of the transmission of nerve impulses and Flaccid paralysis with muscle denervation and atrophy.

The primary infection usually from the respiratory or gastrointestinal tract and can be bacterial or viral (1,2,9), the most notable implicated pathogen is Campylobacter jejuni, with other recognized causes Mycoplasma pneumoniae, Haemophilus influenzae and EpsteinBarr virus (1,9)

around a third of diagnosed patients develop autonomic dysfunctions represented by sinus tachycardia, cardiac arrhythmias, labile blood pressure, orthostatic hypotension, increased sweating, respiratory distress, as well as bladder and gastrointestinal dysfunction.

About 20–30% of patients require mechanical ventilation during the course of the illness (2)

The percentage of mortality is about 5% of affected patients, despite current therapies and advancement in intensive care (7)

MATERIALS AND METHODS

It is a retrospective study analyzing case-series of patients before COVID-19 and after COVID-19 that were registered in the intensive care unit in “Lamine Debaghine” university hospital center, Bab El Oued from 2018 to October 2023

DATA COLLECTION

We undertook a retrospective review of all patients with a diagnosis of AIDP who were admitted to the ICU at Lamine Debaghine hospital between 2018 and 2023.

We registered gender, age, patient medical comorbidities, year of admission.

Respiratory or gastrointestinal infections preceding the onset of symptoms and the temporal evolution of weakness were recorded.

The notion of vaccination and COVID-19 infection were registered

The primary reason for ICU admission, presence of bulbar and autonomic dysfunction (cardiac arrhythmias including sinus tachycardia, labile blood pressure, or gastrointestinal dysmotility), the need for mechanic ventilation and duration of mechanic ventilation, performance of tracheostomy was documented.

All treatments received were noted.

Records were carefully scrutinized for all ICU complications, including hyponatremia hyperglycemia requiring persistent treatment



Major morbidity was defined as: serious infection (pneumonia, sepsis), deep vein thrombosis or pulmonary embolism, severe arrhythmia (brady- or tachyarrhythmias requiring acute intervention, including cardiac arrest), complications of tracheostomy, ileus with or without bowel perforation and respiratory distress.

STATISTICAL ANALYZES

All analyses and figures were done with IBM SPSS version 25. Data outcomes are presented descriptively.

RESULTS

There were 16 cases on 1860 admissions (0.8%) during the past 4 years. 4 cases (25%) were female. 56.3% of the cases are regular smokers.

The mean age is about 54 years old. 18.5% were aged between 3-21 year, 12.8% aged between 22-43 years, 31.3% aged between 44-60-year, 25% were aged between 61-74 years and 12.5 more than 74-year-old.

9 cases were reported during the SARS-COV2 pandemic (56.2%). Only 18.8% of the cases were vaccinated against COVID-19.

About 56.3% reported the notion of COVID-19 infection, were tested positive, or had a flu syndrome after being with someone that was tested positive for COVID-19.

For the causes of admission (fig 3): 50% were admitted for a cardiac dysautonomia. 6.3% of the cases were admitted for a respiratory distress. 12.5% were admitted for bulbar dysfunction. 12.5% were admitted for absence of swallowing reflex. 6.3% were admitted for absence of coughing reflex. 6.3% were admitted for the rapid evolution of the illness (less than 72 hours).

68.8% received IV IG. 12.5% went under plasmapheresis. 62.5% received a complete dose. 56.3% received a full cure.

During hospitalization, 56.3% presented an abolition of swallowing reflex, 37.5% presented an abolition of coughing reflex. 43.3% had blood pressure fluctuations. 56.3% presented a cardiac dysautonomia. 50% presented a hyponatremia.

Only 31.3% presented hyperglycemia. And 37.5% complicated with a sepsis. 18.8% presented a respiratory distress during hospitalization.

1 case of 4 (25%) of COVID-19 AIDP presented as a complication of another infection during hospitalization, for 12.5% of the cases that were not linked to COVID-19 infection. (fig 1)

25% of cases with COVID-19 infection complicated with hyperglycemia, versus 6.2% for the cases with no COVID-19 infection.

25% of cases with COVID-19 infection complicated with blood pressure fluctuations. On the other hand, 18.8% for none COVID-19 for the COVID-19 free patients.

Losing coughing reflex was twice more frequent in the cases with COVID-19 infection, 25% versus 12.5%.

Arrhythmias were described in 37.5% of cases with coronavirus, for 18.8% of none infected people.

Losing swallowing reflex was reported in 31.2% of COVID-19 infected cases and 25% of COVID-19 free cases.

For the habit of smoking (fig 2)

6.2% of cases that smoke complicated with hyperglycemia, versus 25% for the cases with no Tabasco issues.

31.2% of cases with smoking habit complicated with blood pressure fluctuations. On the other hand, 12.5% for the Tabasco free cases.

Losing coughing was reported in both categories, 18.8% of the cases.

Arrhythmias were described in 37.5% of cases with smoking issues, for 18.8% of none smokers.

Losing swallowing reflex was more frequent with cases with smoking habit (31.2%) than none smokers (25%)

25% of the cases needed intubation. 18.3% died during hospitalization. 56.3% had sequelae lesions.

66.66% of sequelae lesions were reported in AIDP patients with COVID-19.

DISCUSSION

Many cases of AIDP and COVID-19 have been reported during the pandemic. In analogy to other viruses, belonging or not to the coronavirus family, neurologic complications in COVID-19 are emerging as the most noticeable aftermath secondary to an abnormal immune-mediated response causing secondary neurological involvement (10). Demyelinating disorders have been previously reported in conjunction with COVID-19, and are also currently considered reflecting a COVID-19 cytokine storm. Amongst the cytokines/chemokines implicated in the COVID-19 cytokine storm, tumor necrosis factor α , interleukin-1 β (IL-1 β), IL-6, IL-17 and interferon- γ have been shown to hold a pivotal role also in GBSs propagation. (12)

The observed AIDP's incidence in SARS-CoV-2-infected patients 0.048% (\approx 5/100,000) exceeds the corresponding average rate of AIDP's in the general population (1-2/100,000). Epidemiological study during the COVID-19 pandemic in the UK reported an incidence of 0.016 (11.12). Comparing to the period before COVID-19 noticed an abnormal increase in the number of patients admitted with AIDP, with higher prevalence amongst old adults (mean age 54-year-old) than before pandemic (mean age 44) (13). It is important to underscore that



an association between the 2 pathologies, with a new form of presentation, is increasingly being observed.

Previous systematic reviews of AIDP's cases in the context of COVID-19 have shown that COVID-19 manifestations consistently precede AIDP's symptoms and support the hypothesis of a post-infectious aetiology (14).

A male preponderance was noted, as with non-SARS-CoV-2-associated.

Clinical presentation, course, response to treatment, and outcome are similar in SARS-CoV-2-associated AIDP and None associated AIDP. (15)

AIDP induced dysautonomia includes blood pressure fluctuations, diaphoresis, dysregulation, and life-threatening cardiac arrhythmias from bradycardia to asystole occur in 7-34% (16). We found that in infected patients it occurs in 37.5% of the cases, which is a bit higher .it suggests that COVID-19 infected patients have a higher risk of cardiac dysregulation.

Hypertension occurs in 60%–70% of patients with AIDP and marked fluctuations in the blood pressure is an indicator of poor prognosis. (17).

Literature reported paroxysmal blood pressure in 24% (18). That's seemingly the same with our infected sample.

However, the studied samples show that the infected cases are more exposed to a quick evolution of symptoms than smoking patients.

Moreover, cases of coronavirus seem to evolve more aggressively than none infected cases.

The result in our study remains divergent at some points compared to others (12) such as : mean age, evolution....

LIMIT OF THE STUDY

The studies analyzed are case reports or case series with small samples, and are therefore considered presenting a high risk of bias.

It is possible that some COVID-19 symptoms could be attributed to a AIDP since both diseases affect the respiratory system.

Details of complications were extracted from medical records, and the analysis of patient outcome was based on available patient follow-up examinations. Retrospective grading of clinical outcome and especially timing of functional improvement can only be considered estimates.

CONCLUSION

Acute inflammatory demyelinating polyneuropathy has shown an increasing number during the corona pandemic, with a signification of severity compared to campylobacter jejuni. Although, the exact mechanism of its gravity remains a mystery.

The heterogeneity of our result compared to reviewed cases, can lead us to the hypothesis of an ethnic predisposition (as the predominance of severe corona cases in Italy during the pandemic).

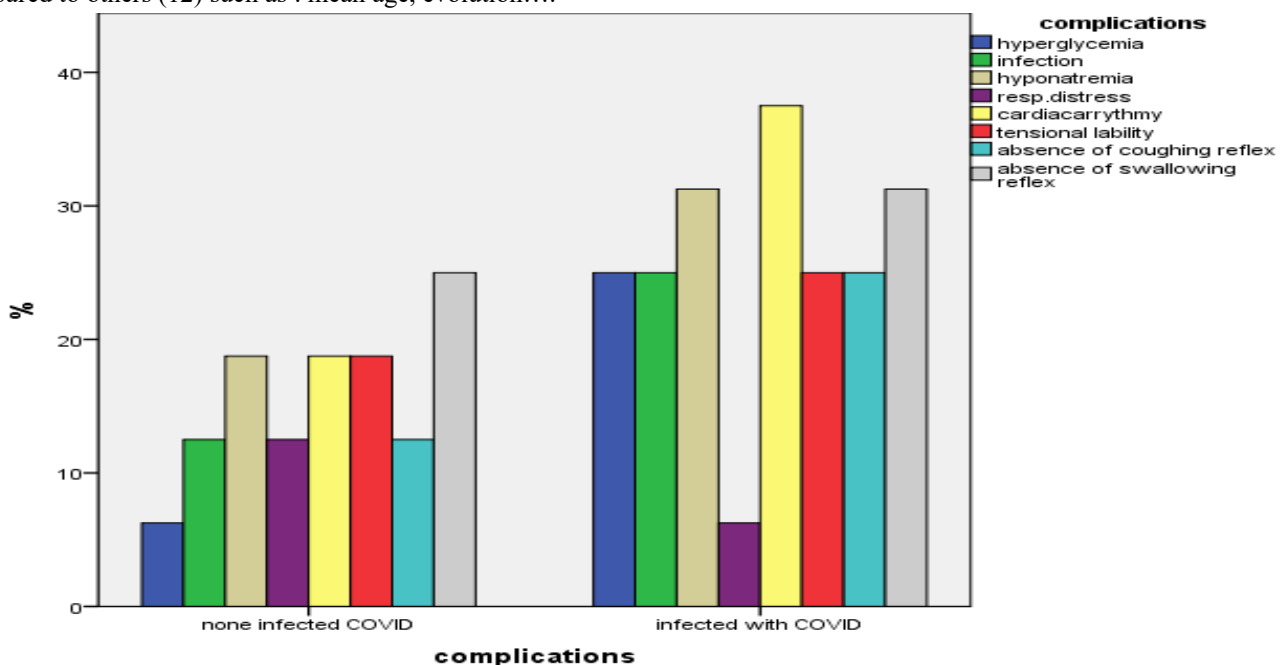


Fig 1: Complications during AIDP reported to infection with COVID-1

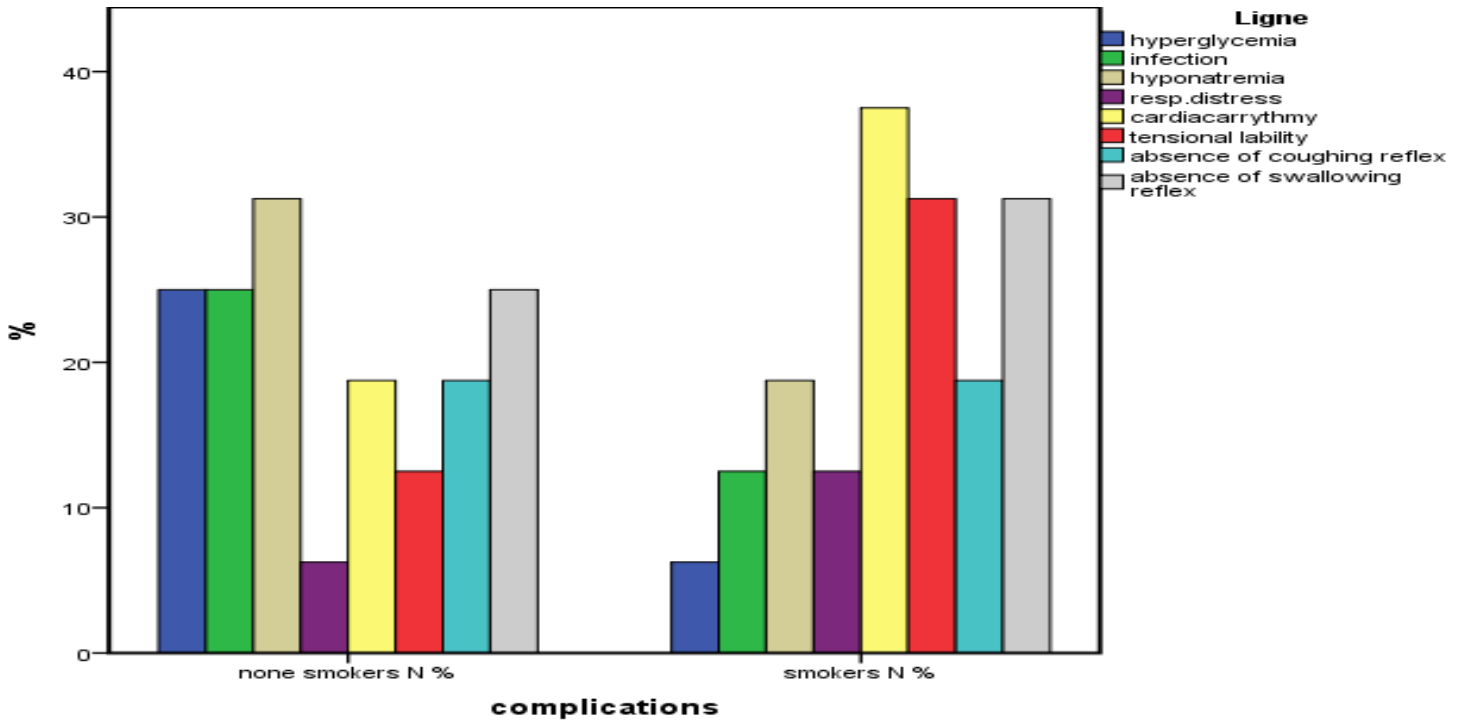


Fig 2: Complications during AIDP reported to Smoking Habit

criteria of admission in icu

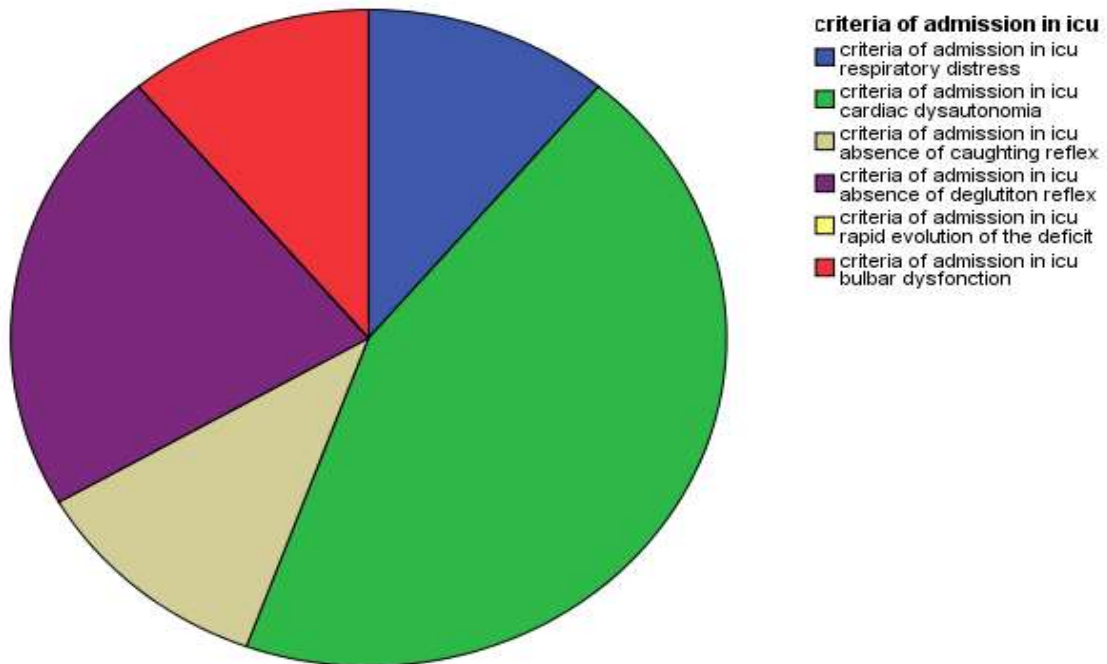


Fig 3 : Criteria of Admission to I.C.U

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