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## Acute generalized weakness in patients referred to Amirkola Children's Hospital from 2005 to 2010

### Abstract

**Background:** Diseases that cause acute flaccid paralysis (AFP) often progress rapidly, thus may cause life threatening complications, therefore, their diagnosis and cure are important. This study was carried out to investigate the causes of acute generalized weakness in children referred to Amirkola Children's Hospital, in Babol, Iran.

**Methods:** In this case series, the epidemiological causes of the disease and clinical features of 15 cases with acute generalized weakness from April 2005 to September 2010 were evaluated. The data were collected and analyzed.

**Results:** The mean age of cases was  $4.7 \pm 3.5$  years. The male/female ratio was 2. Twelve cases had Guillain-Barre syndrome, two with myositis and one with periodic hyperkalemic paralysis.

**Conclusion:** Guillain-Barre syndrome is the most common cause of AFP in children admitted due to acute generalized weakness in Amirkola Children's Hospital.

**Keywords:** Weakness, Paralysis acute disease, Guillain-Barre syndrome.

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**A**cute flaccid paralysis (AFP) is defined as the sudden onset or rapid evolution of flaccid weakness in the absence of encephalopathy symptoms that is always due to motor unit disorders. Among them, Guillain-Barre syndrome is by far the most common (1). Its annual incidence in the whole world was 0.6-4/100000/year, in North and South America was 1-2/100000/year and in Europe was 1.2-1.9/100000/year (1-2).

Other infectious diseases in AFP are poliomyelitis which can induce paralysis in poor countries (3). Parts of AFP include acute intermittent porphyria with annual incidence of 0.1/100000/year in Japan to 2/100000/year in Finland and inheritance tyrosinemia (4). We can name botulism and tick paralysis as neuromuscular diseases in AFP. Periodic paralysis is another diagnosis in AFP which has three types: hypo, normo and hyperkalemic periodic paralysis. Diseases including AFP often progress rapidly and may leave irreversible effects so their early diagnosis are important. In this case series, we investigated the cause of AFP in children referred to Amirkola Children's Hospital, in Babol, North of Iran.

### Methods

In this study, medical history and clinical features of AFP cases from their files from April 2005 to December 2010 were scrutinized. The setting of the study was at Amirkola Children's Hospital in Babol, North of Iran. The data collected and analyzed included age, gender, preceding events, motor and sensory deficits and patients with trauma history were excluded from the study. The Guillain-Barre syndrome (GBS) diagnosis criteria include antecedent viral infection, progressive motor weakness involving more than one limb and areflexia.

The myositis diagnosis criteria included respiratory symptoms before the onset of the disease, symmetrical muscle pain and severe weakness in calf muscles, presence of tendon reflex and increased serum creatine kinase (CK). For the other diseases, the diagnosis was based on clinical and lab data findings. The data were collected and analyzed.

**Results**

Fifteen cases were diagnosed as having AFP; 12 GBS, 2 myositis and 1 hyperkalemic periodic paralysis. The annual incidence of GBS was 0.75/100,000/year. The mean age of cases was 4.7±3.5 years range 9 months to 13 years. The male/female ratio was 2. There were no death, no mechanical ventilation necessity, no immunization history and no sensory level. Infection history was present in 8 cases of GBS. No case had sensory level. Sensory disorder was in one case of GBS that was a pain sensed in lower limbs. Muscle pain was in 2 GBS, 1 myositis and 1 hyperkalemic periodic paralysis. Motor disorders were in all cases in a variety of limping to walking debility (table 1).

Muscle weakness was in 10 cases of GBS, 2 myositis and 1 hyperkalemic periodic paralysis. Deep tendon reflexes (DTR) was absent in 8 cases of GBS. One case of GBS had decreased DTR. Dysphonia was present in 1 case of GBS. There was no dysphagia. Cerebral nerve disorder was in 1 case of GBS (facial nerve). Nerve conduction study was done in 7 cases of GBS: 4 normal and 3 abnormal cases which were all demyelination became positive after 3 weeks.

**Table 1. characteristics of 15 cases with acute flaccid paralysis**

Variables	cases No (%)
<b>Age (year)</b>	
Up to 5	9 (6.1)
5-10	4 (26.6)
10-15	2 (13.3)
<b>Gender</b>	
Male	10 (66.6)
Female	5 (33.3)
<b>Cause</b>	
GBS*	12 (79.8)
Myositis	2 (13.2)
HPP**	1 (6.6)

\* Guillain-Barre syndrome    \*\* Hyperkalemic periodic paralysis

**Discussion**

Our study showed that Guillain-Barre syndrome is the most common cause of AFP in the children admitted due to acute generalized weakness in Amirkola Children’s Hospital which was the same in different studies like Molinero’s study (5). The annual incidence of AFP in our region was similar to the others like the Italian and Australian studies. This is true about GBS. The male/female ratio was 2, which was similar to the results of other studies (6, 7). Of course, some other studies showed no gender differences (5). Infections, especially a respiratory one; had a highlight part in our GBS patients similar to the results of others (6, 8).

We did not assess the type of pathogens. Other studies showed that campilobacter jejuni, citomegalovirus, Epstein-barr virus and mycoplasma pneumoniae were the most common pathogens (9). We found that the most abnormal nerve conduction study (NCS) was demyelination like the result of Linden et al. (10). None of GBS cases had immunization history. Some studies did not show any relation between GBS and vaccination but in another study, vaccination has played a small part (11-13). We were not certain of the subtypes of GBS, but in Europe and North America, acute inflammatory demyelinating polyneuropathy (AIDP) was the most common (2). In our study, two subjects had myositis and one had hyperkalemic periodic paralysis. In our region, hygiene statistics had reported no case of polio; both wild and vaccine are derivated but unfortunately wild polio has induced paralysis in poor countries, and vaccine are derivated polio which has no clinical difference with the wild one (13, 14). This has been reported from some areas and maybe this is why we should trust to inactivate polio vaccine which is more expensive of course and now it is used in some countries (15).

We did not have other diagnosis of AFP in our cases like acute transverse myelitis, acute intermittent porphyria, tick paralysis, inheritance tyrosinemia, corticosteroid induced paralysis and paralysis in ICU patients. In conclusion, the results show that Guillain – Barre syndrome is the most common cause of acute flaccid paralysis in our region.

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**Conflict of interest:** None declared.

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