Original Article

Guillain-Barré syndrome complicating pregnancy and correlation with maternal and fetal outcome in North Eastern India: A retrospective study

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Abstract

Background: Guillain-Barré syndrome (GBS) is rare in pregnancy with an estimated incidence between 1.2 and 1.9 cases per 100,000 people annually, and it is generally accepted that it carries a high maternal risk. Most reports of GBS with pregnancy are case reports only. **Aim:** Purpose of this retrospective study was to find the correlation between pregnancy and GBS. **Settings and Design:** Records of patients admitted in neurology division were analyzed in a tertiary care teaching hospital in the northeastern Indian pregnant female population with GBS between 15-49 years during the period of 2009-2013. **Materials and Methods:** We analyzed the records of 47 patients with pregnancy and GBS, evaluated and treated in our institute from August 2009 to December 2013. This is retrospective observational study done in North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), India. **Result:** Predominant form of GBS was acute inflammatory demyelinating polyneuropathy (AIDP). The weakness started from the lower limbs in majority of patients. Ten percent of women had bifacial weakness. Most of patients had good maternal and fetal outcome. Two patients received intravenous immunoglobulin (IVIG). Only two patient required ventilator supports and one patient had intrauterine death (IUD) and died due to respiratory failure. **Conclusion:** Our results indicate that risk of GBS increases in third trimester and first 2 weeks after delivery. Demyelinating variety of GBS was common in our population. GBS natural course during pregnancy is mild and showed quick recovery. Maternal and perinatal outcome was good.

Key Words

Guillain-Barré syndrome, immunoglobulins, post-partum period, pregnancy

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Ann Indian Acad Neurol 2015;18:215-218

Introduction

Guillain Barre Syndrome (GBS) is an acute monophonic type of inflammatory demyelinating polyradiculoneuropathy usually associated with symmetrical progressive muscle weakness, areflexia (loss of tendon jerks), and albumin cytological dissociation (a raised protein level but normal cell count) in the cerebrospinal fluid. The diagnostic criteria for GBS are well — defined.[1] Some case reports indicate that GBS occurrence during pregnancy may have been lower than expected.[2] GBS can occur in any trimester of pregnancy and post-partum period but particularly in third trimester and first 2 weeks post-partum. GBS is known to worsen in post partum period due to an increase in delayed type of hypersensitivity. The neglect regarding study of GBS complicating pregnancy may have resulted from one of many gaps in our arbitrary medical division of labor (no pun intended). Other investigators having taken the position that pregnancy is someone else's business, the more remote consequences of pregnancy and the puerperium have been left for the obstetricians, who are kept busy enough with short term outcomes.[2] Delayed diagnosis is common in pregnancy or immediate postpartum period because the initial non-specific symptoms may mimic changes in the pregnancy.[3] The relation between GBS and pregnancy or delivery is of special interest because of the dramatic character of GBS symptoms in a woman facing delivery. The purpose of this study was to quantity the risk of GBS for the mother during the pregnancy and postpartum periods and look for correlation between pregnancy and GBS. It has never been reported to the best of author's knowledge and belief.

Access this article online	
Quick Response Code:	Website: www.annalsofian.org
	DOI: 10.4103/0972-2327.150608

Materials and Methods

We did a retrospective descriptional analysis of all females cases of >16 years women of GBS with pregnancy that were admitted in the hospital between August 2009 to December 2013. Records of the medical records departments were searched. Confirmed cases of GBS with pregnancy were selected based on standard clinical criteria.[4] A total of 47 patients were admitted with diagnosis of GBS with pregnancy were studied. Epidemiological data was collected including duration of symptoms before admission and duration of hospital stay. The pattern of involvement of limbs was recorded. GBS disability scaled adapted from Hughes *et al*.[5] Involvements of cranial nerves were looked for in all patients. Cerebrospinal fluid (CSF) study done in all cases. Nerve Conduction study was performed within 2 weeks of illness and if indicated was repeated using conventional procedures. Patients were classied acute inflammatory demyelinating polyneuropathy (AIDP), acute motor axonal neuropathy (AMAN) or others on the basis of electro diagnostic criteria reported by Hadden and colleagues.[6] Patients were GBS with pregnancy without any of above three were excluded from the study even if recovered GBS were noted. All obstetrics parameters were studied in detail including fetal outcome.

Results

Forty-seven patients fulfilled the criteria for study. The median age of patients were 25.6 yrs (range 16-49) [Table 1]. The mean duration of symptoms on admission was 5.17 days (range 2-19 days). The mean duration of hospital stay was 7.3 days (range 4-25 days). All patients presented at stage 1, that is progressive phase [Table 2]. Sensory symptoms were present in 32 (68%) whereas only two patients had sensory findings on examination. No patients had extraocular muscle involvement. Only five (10%) had bifacial weakness. Oropharyngeal weakness was observed in seven (14.8%). GBS disability scale adapted from Hughes et al., ranged from grade 4-5 (more than 3). One patient presented in first trimester, seven patients (14.89%) were in second trimester, 15 (31.2%) were in third trimester and remaining 24 (51%) were presented in postpartum especially within 2 weeks. Electrophysiological subtypes — based on electrophysiological criteria, 32 (72.7%) of 44 patients were classified as AIDP and 12 (27.2%) of 44 patients as AMAN. Electrophysiological data were not available in three patients. Dysautonomia was seen in nine (19.1%). Twenty three (48.9%) had onset of weakness in the lower limbs and rest had simultaneous weakness in both upper and lower limbs. CSF analysis of all patients showed albuminocytological dissociation universally. Two patients received intravenous immunoglobulin (IVIG) infusions as our institute have no facilities for plasmapheresis.

Vital Capacity less than 20 mL/kg or a decline by 30% from baseline, maximal inspiratory pressure less than 30 cm H_20, and maximal expiratory pressure of less than 40 cm H_20 was highly correlated with a subsequent progression to respiratory failure and intubation. The use of these data ("20/30/40 rule") allowed identification of patients at risk of respiratory failure early and the institution of preemptive measures such as admission to the ICU. Elective intubation for ventilator assistance was performed when FVC fallen below 12-15 ml/kg or below 18 ml/kg in patients with severe oropharyngeal weakness, or when arterial P O2 values fall below 70 mm Hg with inspired room temperature. Two patients developed respiratory distress and required mechanical ventilation. Two patients undergone cesarean section as one was having history of previous two cesarean deliveries and one had transverse lie presentation rest two were operated outside, admitted as postpartum GBS. One patient had instrumental (ventuse) delivery [Table 3]. Half of (50%) postpartum were delivered at home. Two patients who had stillbirth one was delivered at home. Apgar score was >7 in most of delivered babies [Table 4]. Only one woman had intrauterine death and died due to respiratory failure. Patients were followed-up for 6 months for recurrence, disability. Overall outcome was good irrespective of electrophysiological subtypes.

Discussion

GBS represent a heterogeneous group of immune mediated peripheral neuropathy. The preceding infection may cause an autoimmune response against the various components of peripheral nerve myelin and sometimes the axon.[5] GBS

Table 1: Patients characteristics

Age	28 (16-49)
Primiparous (%)	13 (27%)
Multiparous (%) h/o	34 (72.3%)
Miscarriages 1	07 (14.0%)
5 deliveries	16 (47%)
Mode of delivery	
Vaginal delivery	42
Caserean section	4
Instrumental	1

Table 2: Clinical characteristics of the study population

Received IVIG	2
Mechanical ventilation	2
Duration of symptoms on onset	5.17 (2-19 days)
Duration of hospital stay	7.3 (4-25 days)
Bifacial weakness	5 (10%)
Oropharyngeal weakness	7 (14.8%)

IVIG = Intravenous immunoglobulin

Table 3: Complications of pregnancy

Premature rupture of membrane	3
Preterm delivery	1
Total cesarean section	4
Elective cesarean section	0
Postpartum hemorrhage	1

Table 4: Perinatal outcome

Meconium staining of amniotic fluid	3
Apgar <7 at 5 min	1
Intrauterine growth restriction	2
Neonatal intensive care admissions	5
Still birth	2

classically presents with pain, numbness, paresthesia, or weakness of the limbs and this can be mistaken for a psychological complaint, leading to delay in diagnosis and treatment.[7] Although the etiology of GBS is unknown, there is strong evidence that autoimmune mechanisms play a major role in GBS pathogeneses.

Reports from nonpregnant population revealed that antecedent infectious event could be identified in two-thirds of cases. In our study we did not perform serological tests for *Capylobacter jejuni*, CMV, EBV and *Mycoplasma pneumoniae* due to financial constrains.

GBS can occur in any trimester of pregnancy and post-partum period but particularly in third trimester and first 2 weeks post-partum.[8] In our study this observation was confirmed. GBS is known to worsen in post partum period as most of our study (51%) population was, due to an increase in delayed type of hypersensitivity as reported by da Silva *et al*., when GBS was diagnosed at 15 weeks of pregnancy and aggravated post partum.[9]

Up to 20% of patients are disabled after 1 year and a maternal mortality of exceeding 10% has been described (nonpregnant GBS has mortality <5%).[10] Reports before the mid-1980 suggested that GBS in pregnancy carries a high maternal morbidity and mortality.[11] It was reported that as many as 34.5% of women suffering from GBS during pregnancy required ventilator support.[12] Our observation contradict earlier study as majority of our patient recovered well and needed no mechanical support. This can be explained by majority of studied women had demyelinating variety of GBS and it is uncertain whether availability of active treatment such as plasmapheresis and immunoglobulin together with advancement in intensive care has improved maternal outcome.

It was of opinion that management of pregnancy with GBS does not differ much from that in nonpregnant patients with this disease. Two patients received IVIG infusion Supportive care remained cornerstone of treatment in most of our patients. Management of airway and respiratory infection, maintaining fluid and electrolyte balance, nutritional support and effective rehabilitation was taken care. Attention was paid to the identification and treatment of infective complications such as nosocomial infection and urinary tract infection because of common occurrence and more severe in pregnant women, prevention of venous thromboembolism, pain and dysesthesias management and the management of psychological distress resulting from disease and anxiety towards pregnancy. Apart from that physiotherapy and early mobilization was encouraged.

Most of our patients delivered normally except two patients who undergone cesarean section had obstetric indications. Therefore abortion or cesarean sections are not considered to be indicated.[11] Ventuse was applied to one patient to reduce prolonged second stage of labor. So unnecessary obstetric intervention must be strongly resisted.[13]

Bahadur *et al*., described a 25-year-old gravid 3, para2, woman at 21 weeks of pregnancy with successful maternal and fetal outcome.[14] Majority of our women were multiparous as in Meghalaya grand multiparity is very common and it did not affect outcome. The fact that the incidence of GBS during the first 4 months of pregnancy was not low, comprising one admitted in our study patient, argues against the notion of a protective effects of the first months of pregnancy. Vijayraghavan *et al*., have reported its management at 16 weeks of pregnancy.[7] Goyal *et al*., have reported the management of a primigravida presenting at 26 weeks of gestation with plasmapheresis.[15]

Risk of prematurity is low and occasionally fetal death may occur as in one of our pregnant patient who died along with stillbirth. In case ventilator support is required in pregnancy, the risk of premature birth has been noted to be greatly increased.[14] Hence an obstetrician must be vigilant if a pregnant woman complains of generalized muscular weakness and respiratory discomfort.

Exposure to certain known risk factors of GBS, such as certain infections or drugs, precedes GBS onset by about 2 weeks.[16] Thus the increased risk maybe caused by some unidentified factors acting near the end of pregnancy. Because humoral factors are shared by mothers and their neonates via passive transfer whereas cellular components are not, the hypothesis that cell mediated immunity is the major mechanism in the pathogenesis of GBS is highly plausible.[16] One mechanism that has been proposed is that of endogenous antigen transfer. Fetal cells do move into the maternal circulation.[17,18] The endogenous antigen transfer to a system temporarily disarmed with respect to the recognition of nonself could play a role.

Changes in the physiology of the immune system offer a more likely alternative. It is thought that pregnancy temporarily enhances the production of anti-inflammatory Th2 cytokines which are secreted at the maternal-fetal interface and act systemically.[19] These agents promote humoral immunity, downgrade production of proinflammatory Th1 cytokines, which are deleterious to pregnancy in women, and thereby facilitate growth and development of the "fetal allograft". Proinflammatory cytokines clearly plays a role in the pathogenesis of chronic autoimmune disorders, such as rheumatoid arthritis and multiple sclerosis.[20]

To the extent that this GBS with pregnancy is considered representative of pathogenesis of other autoimmune conditions, our findings should stimulate interest among obstetricians as well as neurologists.

Conclusion

GBS course during pregnancy is mild and showed quick recovery. Our results indicate that risk of GBS increases in third trimester and first 2 weeks after delivery. It can be concluded that demyelinating variety of GBS is common in our study population. It highlights the combined role of gynecologist and neurologists in the management of GBS during pregnancy, which if missed can be detrimental, both for mother and fetus. Early diagnosis and prompt intensive multidisciplinary supportive care in GBS complicating pregnancy improves the prognosis for both mother and fetus.

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How to cite this article: Sharma SR, Sharma N, Masaraf H, Singh SA. Guillain-Barré syndrome complicating pregnancy and correlation with maternal and fetal outcome in North Eastern India: A retrospective study. Ann Indian Acad Neurol 2015;18:215-8.
Received: 24-09-14, **Revised:** 14-09-14, **Accepted:** 07-10-14

Source of Support: Nil, **Conflict of Interest:** None declared.