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Two cases of fourth nerve palsy in pregnancy

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Abstract

Aim: **To present two cases of recent-onset fourth nerve palsies during pregnancy.**
Methods: **Two pregnant patients presented to A&E with recent-onset diplopia due to isolated right superior oblique palsy. Patient 1, aged 42, complained of a 5-day history of intermittent vertical diplopia at 38 weeks gestation. Patient 2, aged 34, presented with constant horizontal and vertical diplopia at 34 weeks gestation.**
Results: **Two months after giving birth, patient 1 attended the eye clinic reporting her symptoms had completely resolved within 5 days from onset. Patient 2 reported her symptoms resolved within 3 months. Both patients fully recovered, therefore no further management or investigation was required. They both gave birth at term without complication. Patient 1 presented with a slight hyperphoria in primary position, demonstrating binocular single vision (BSV). Ocular motility and Hess chart showed a very slight right superior oblique under-action. Her blood pressure, fundus and media were normal and no underlying pathology was found. No further investigations were undertaken. Patient 2 presented with a slight exotropia and right hypertropia in primary position, with diplopia and no BSV demonstrable. Further orthoptic testing showed right superior oblique under-action. No pathology was found.**
Conclusions: **Cranial nerve palsies developing in pregnancy are rare but have been reported. No pathology was found in our cases; however, the literature does suggest that serious cases could be apparent and should therefore be considered.**

Key words: Cranial nerves, Pregnancy

Introduction

We present two cases of acute-onset fourth nerve palsies during pregnancy. Cranial nerve palsy in pregnancy is a rare occurrence, with only 3 cases of fourth nerve palsy reported. Wide-ranging aetiologies are reported in the literature.

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Case reports

Case 1

A 42-year-old woman, in her first pregnancy, presented at 38 weeks of gestation to eye casualty with intermittent diplopia. The vertical diplopia had been present over 4 days with sudden onset, worse on laevoversion. Since its onset the patient reported no change in severity or frequency of diplopia.

Blood pressure was within normal limits (110/70 mmHg). There was no previous ocular history, no obvious precipitating factors and no abnormal head posture.

Visual acuity was right eye 6/6 left eye 6/9 Snellen acuity, with normal colour vision. A right hyperphoria with good recovery measuring 4 dioptres for near and distance was noted. She had a vertical fusion range of 3 dioptres base up to 2 dioptres base down. Ocular motility revealed a subtle right superior oblique under-action, with confirmation on the Hess chart (Fig. 1). A diagnosis of recent-onset fourth nerve palsy was made.

A day later the patient returned with worsening complaints of diplopia. However, orthoptic assessment remained unchanged (Fig. 2).

The patient's symptoms improved by 5 days after onset, after she had given birth to a healthy baby boy by normal delivery, and had fully recovered by 3 months of onset. Ophthalmological assessment after delivery indicated normal and quiet anterior segments, normal pupillary reactions and normal fundal examination. Her intraocular pressures were 15 mmHg. In view of the full recovery of diplopia and normal ophthalmological examination the patient was discharged.

Case 2

A 34-year-old woman in her third pregnancy presented at 34 weeks of gestation to eye casualty with sudden-onset constant vertical and horizontal diplopia since the previous night. She complained of a longstanding pain in her left eye associated with headaches. Blood pressure at presentation was 115/73 mmHg.

Visual acuity was right eye 6/5 left eye 6/5 Snellen acuity. Orthoptic examination revealed a right exotropia and hypertropia with constant diplopia. Prism cover test

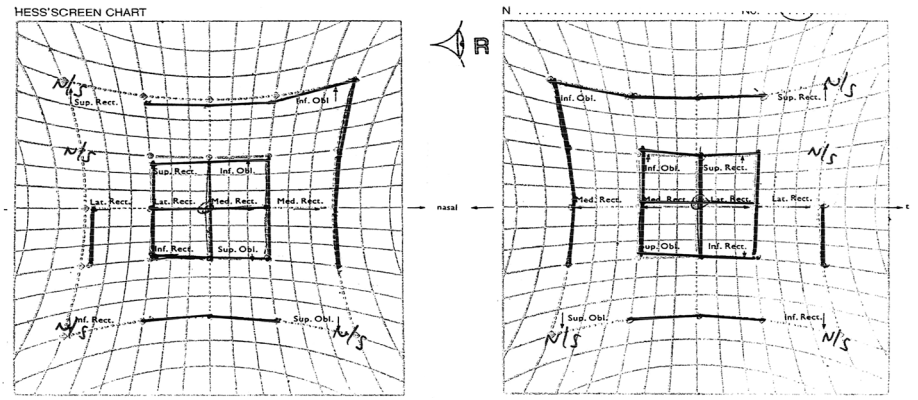

Fig. 1. Hess chart of patient 1 on her first day of presentation.

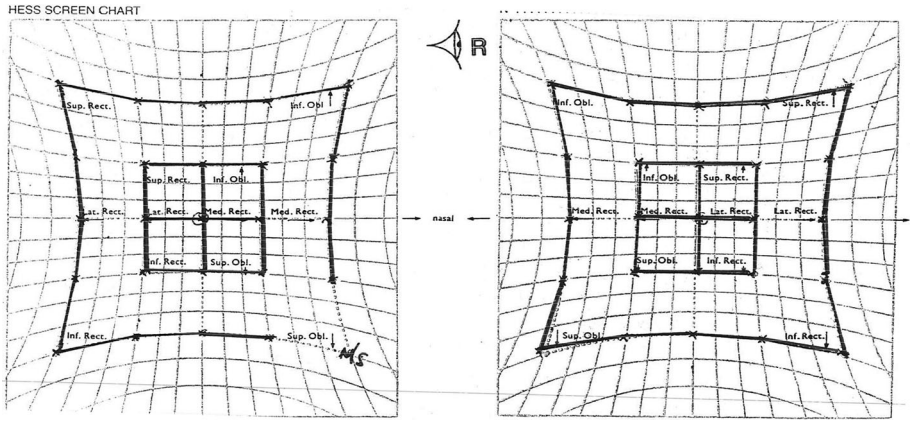

Fig. 2. Hess chart of patient 1 on her second day of presentation.

revealed a similar angle for near and distance (near: 4 dioptres base in, 2 dioptres right hypertropia; distance: 1 dioptre base in, 2 dioptres right hypertropia). There was no demonstrable area of binocular single vision (BSV). Ocular motility revealed a right fourth nerve palsy. A Fresnel prism was given to alleviate the diplopia but the patient declined this in favour of a total occlusion patch.

Ophthalmological assessment revealed disc cupping, normal colour vision, normal pupillary reactions and normal intraocular pressures of 16 mmHg. The glaucoma team and neurological team examined the patient and noted enlarged optic nerves with physiological disc cupping, intraocular pressures of 12 mmHg for each eye, normal Humphrey visual fields, and normal anterior segment and fundus examination. In view of these satisfactory findings the patient was discharged from both services.

Three days after the onset of symptoms the diplopia started to gradually improve, with complete resolution within 3 months of onset. At the last orthoptic assessment the patient had full ocular motility and normal BSV. Ophthalmological review was unremarkable. The patient gave birth to a healthy boy at full term by normal delivery 4 weeks after initial presentation.

Discussion

Cases of fourth nerve palsies in pregnancy have been reported in the literature between 1980 and 2013, all of which were concluded to be longstanding decompensated fourth nerve palsies.[1] These patients were all found to have enlarged vertical fusion ranges and one had reported diplopia since the age of 10 years, which worsened during her pregnancy. Neither of our patients had an enlarged vertical fusion range, abnormal head posture or any previous symptoms. Our cases both completely resolved within 3 months of onset, with case 1 resolving after delivery and case 2 resolving before delivery.

Third and sixth cranial nerve palsies during pregnancy have also been reported in the literature. A total of 25 cases of cranial nerve palsies have been reported, the majority being sixth nerve palsies (15 cases; Tables 1–4). Sixth nerve palsy would be the most likely cranial nerve palsy if the blood pressure was elevated due to preeclampsia. Preeclampsia is a disorder of pregnancy characterised by high blood pressure and large amounts of protein in the urine. If left untreated, it can develop into eclampsia, which is a life-threatening occurrence of seizures during pregnancy. Preeclampsia was found in 6 of the 15 reported cases of sixth nerve

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Table 1. Patients in the literature with onset of cranial nerve palsy during the first trimester (8–12 weeks)

Gestation at time of onset (weeks)	Aetiology	Cranial nerve palsy	Recovery	Reference
8	Cerebral venous sinus thrombosis	Bilateral 6th	4 weeks, pre-partum	Munira *et al*. (2012)[2]
11	Pituitary macroadenoma enlargement during the pregnancy	Partial 3rd	3 days, post-partum	Saunders (1985)[3]
12	Guillain-Barré syndrome	3rd (pupil sparing), bilateral 5th, 9th, 10th, 12th	4 weeks, pre-partum	Shindo *et al*. (2008)[4]

Table 2. Patients in the literature with onset of cranial nerve palsy during the second trimester (13–27 weeks)

Gestation at time of onset (weeks)	Aetiology	Cranial nerve palsy	Recovery	Reference
24	Febrile illness 2 weeks prior to onset	6th	14 weeks, pre-partum	Sternberg *et al*. (1980)[5]
24	?Congenital	4th	44 weeks, post-partum	Jacobson (1991)[1]
25	Intracranial mass in the paranasal sinuses	6th	6 weeks, pre-partum	Rassekh *et al*. (1996)[6]
25	Intracranial vasculitis and multiple abscesses	3rd and 6th	Unknown	Cihangiroglu *et al*. (2001)[7]
26	Meckel's cave arachnoid cyst	6th	42 weeks, post-partum	Jacob *et al*. (2008)[8]
27	?Congenital	4th	13 weeks, post-partum	Jacobson (1991)[1]

Table 3. Patients in the literature with onset of cranial nerve palsy during the third trimester (28–40 weeks)

Gestation at time of onset (weeks)	Aetiology	Cranial nerve palsy	Recovery	Reference
31–38	Preeclampsia	• 3rd involving pupil × 3 • 6th ×3 • Multiple 3rd and 6th	5 days to 12 weeks post-partum	Barry-Kinsella *et al*. (1994),[9] Bonebrake *et al*. (2004),[10] Park and Kim (2007),[11] Watanabe *et al*. (2006),[12] Chuah *et al*. (2010),[13] Chutatape and Teoh (2013),[14] Vallejo-Vaz *et al*. (2013)[15]
32	PCA aneurysm	Partial 3rd, pupil sparing	12 weeks post-partum	Foroozan *et al*. (2002)[16]
34	Burkitt's lymphoma	6th	Post-partum	Jahani *et al*. (2009)[17]
34	Pituitary macroadenoma	3rd, pupil sparing	4 weeks post-partum	Lee *et al*. (2014)[18]
37	?Congenital	4th	11 weeks post-partum	Jacobson (1991)[1]
38–40	No pathology	6th	3–6 weeks post-partum	Fung and Chung (1999),[19] Thamban *et al*. (2006),[20] Haslinda *et al*. (2013)[21]
40	Intracranial hypertension	Left 6th	24 weeks post-partum	Bladè *et al*. (1970)[22]

Table 4. Patients in the literature with onset of cranial nerve palsy after delivery

Time after delivery at onset	Aetiology	Cranial nerve palsy	Recovery	References
11 days	Preeclampsia	6th	8 weeks	Thurtell *et al*. (2006)[23]

palsy (1 patient also had intracranial hypertension), all of which resolved. Of the third nerve palsy cases that have been reported in the literature, 4 of 9 had preeclampsia and also resolved post-partum.

Although both our patients had normal blood pressure at presentation, it could be postulated that they sustained a transient rise in blood pressure in the third trimester which could cause microvascular disruption resulting in the cranial nerve palsy.

The majority of cases reported in the literature were unilateral, with only 3 cases involving multiple cranial nerve palsies. This suggests other aetiologies rather than a direct relationship to the pregnancy, unlike the two cases we report (Tables 1–3). Both our patients fully recovered within 3 months of onset of the problem, and no aetiology was found. By comparison only 3 of 25 cases in the literature were reported to have no known aetiology.

The cases we present both occurred in the third trimester of pregnancy. Although this was the case in the majority of patients reported in the literature, onset was found at any stage of pregnancy (Tables 1–4). Cranial nerve palsies developing in the first trimester all had serious underlying causes.

Regardless of aetiology, all cases of diplopia in the literature fully recovered, with symptoms lasting between 3 days and 11 months from onset. Of the cases we present, 1 recovered pre-partum (before birth) and 1 post-partum. In comparison, of those reported in the literature 17% resolved pre-partum and 83% resolved post-partum.

In the literature no association was found with whether the patient had a normal delivery or a caesarean section. Half of the patients had a normal delivery, the rest having caesarean section. Both our patients had normal deliveries.

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Conclusion

In summary, although cranial nerve palsies in pregnancy are rare, they can occur in any trimester and may require further investigations depending on signs and symptoms. The cause could be sinister in view of the wide-ranging aetiology in the literature.

The 2 cases we present were both of fourth nerve palsies; however, there is a possibility of any cranial nerve palsy occurring. The literature shows a higher incidence of sixth nerve palsies, with the majority being unilateral.

Neither our cases, nor those reported previously, required surgical intervention for their diplopia, including the decompensated longstanding cases reported by Jacobson.[1] Importantly, all patients went on to have a healthy baby regardless of mode of delivery.

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