CASE SERIES

An unexpected delivery: pregnancy experience of a paraplegic lady

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INTRODUCTION: Spinal cord injury (SCI) has increased over the years, and so has the survival. Women with SCI remain fertile and have equal chance of pregnancy.

CASE PRESENTATION: We described a case of a 29-year-old lady with traumatic spinal cord injury (SCI) resultant with paraplegia in 2008, who conceived naturally 2 years after the injury. She only had her antenatal check-up at a low-risk antenatal center throughout her pregnancy and was not referred to specialized obstetric care. She did not appreciate active labor, and unexpectedly had a precipitous labor and gave birth in the bathroom.

DISCUSSION: Pregnancy is relatively safe in women with spinal cord injury (SCI). However, disability-related issues can be exaggerated during pregnancy, delivery and post-partum periods. Thus, understanding common issues related to pregnancy in this population is important. Specialized obstetric care with rehabilitation input throughout antenatal and postnatal care is crucial for a good overall outcome of a pregnant woman with SCI.

Spinal Cord Series and Cases (2017) 3, 17002; doi:10.1038/scsandc.2017.2; published online 4 May 2017

INTRODUCTION

Spinal cord injury is increasing in number over the years, and Tan *et al.*¹ reported highest incidence in the 20–29-year age group. Survival after a spinal cord injury has improved over the years,² and survivors continue with their lives, including progressing in career and inter-personal relationship. Fertility does not pose an issue for women with SCI, as they remain fertile and are able to conceive, albeit the rate of pregnancy was 13.9% lower compared with non-SCI women.³ However, due to the rarity, not many healthcare professionals are comfortable in handling issues related to pregnancy in spinal cord-injured women owing to lack of experience.⁴

CASE REPORT

This case report describes a case of a 29-year-old lady with T3 AIS A since 2008 after a road traffic accident, and her pregnancy experience with an unexpected delivery. She was referred for spinal rehabilitation consult when she was admitted to the orthopedic ward for infected pressure ulcers resultant into septicemia. Rehabilitation review was done, and we encountered a valuable history of her pregnancy experience as a paraplegic woman.

Prior to the incident, she was an employee, wife and mother. She has one daughter and lived with her family and in-laws. After the accident, she underwent an outpatient rehabilitation program in a private hospital for 2 years, but later defaulted her rehabilitation review and follow-up. She remained independent despite not being able to return to previous gainful employment and was thus reimbursed with invalidity pension.

She naturally conceived her second child two years after the spinal cord injury in 2010. She registered at a low-risk antenatal center at a nearby district hospital. During the pregnancy, she

received routine antenatal check-up at home by a visiting midwife from the local clinic. She was free of excessive early pregnancy symptoms. Routine fundal height examination followed the gestational age. No uterus and fetal imaging assessment was performed during the antenatal check-up.

She was very fortunate for not encountering any pregnancy-related medical comorbidity like pregnancy-induced hypertension, no symptoms of urinary tract infection (UTI) or autonomic dysreflexia (AD). She was also not told and aware of having anemia during her pregnancy. Thus, she was never referred by the midwife to an obstetrician at the tertiary hospital for antenatal follow-up. She was also able to maintain her daily routines independently until later in pregnancy, where she needed assistance for transfer from wheelchair to bed and vice versa. The only problem she had during the pregnancy was existing pressure ulcer prior to pregnancy at the ischial tuberosity, which was not worsening.

She had an unexpected precipitous delivery two weeks earlier than the expected date of delivery (EDD). She was seated on her commode chair while preparing herself for shower when she suddenly heard a sound of crying baby. The baby was noted lying on the commode bucket. Realizing that she has already delivered a baby, she called for help. She was sent to the nearby district hospital by ambulance with her baby. Both mother and baby did not sustain any complications. They were hospitalized for 1 day and both were discharged well.

Her post-partum period was uneventful. She regained her independence in self-care, transfer and wheelchair ambulation. She described some limitation as a mother. Though she was able to breastfeed her baby for 1 month similar to her first daughter, when it came to bottle feeding, she was only able to prepare the milk but not feed the baby herself as she felt it difficult handling

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Received 3 September 2015; revised 1 December 2016; accepted 3 January 2017

Table 1. Common medical and functional issues in obstetric care of SCI women

Issues	Antenatal	During labor	Postnatal
Medical	Instability of blood pressure ^{3,7}	Increase preterm labor and delivery ^{3,6,7,13}	Increased risk of pelvic and vaginal infection ⁶
	Anemia in pregnancy ⁶	Autonomic dysreflexia ^{3,6,7}	
	Change of bowel and bladder habit ^{3,5,6}	Seizure ⁷	
	Recurrent urinary tract infection ^{5,6,7,13}	Pre-eclampsia ¹³	
	Increase in maternal infection ⁵	Increased bladder spasm ³	
	Increase in occurrence of new pressure ulcer ^{6,13}	Increased spasticity ³	
	Increase in spasticity ⁶	Increased assisted delivery and cesarean section ^{3,7,13}	
Functional issues	Increased dependency in transfer and mobility ³		Lower breastfeeding rate ^{3,5}

her baby while she was on wheelchair. Her mother-in-law helped in bathing and grooming of her baby.

We encountered her for spinal rehabilitation review during her admission at the Orthopedic ward for infected stage IV ischial tuberosity pressure ulcer. This was after almost 1 year of her delivery. Rehabilitation management at that point focused mainly on the cause of worsening pressure ulcer and prevention from new ulcers. She had surgical debridement of the pressure ulcer and was managed with intravenous antibiotics. Unfortunately, she developed septicemia secondary to infected pressure ulcers, and succumbed to death.

DISCUSSION

Pregnancy is relatively safe in women with SCI. However, pregnant women with SCI experienced 25% more complications compared to able-bodied women.³ The complications encountered are usually related to the disability.⁵ Table 1 summarizes the commonly encountered medical complications during pregnancy, labor and post-partum in women with SCI.

Pregnant women with SCI should have routine antenatal follow-up to monitor weight, blood pressure, blood parameters and urine screening. Ultrasound for (1) fetal anomaly screening especially for those on regular medication as most of the medications prescribed for persons with SCI are teratogenic, and they were more commonly exposed to radiation procedure compared to non-SCI women,⁶ and (2) preparation during labor and delivery especially to locate for fetal and placenta lie.⁷ It is known that baseline blood pressure in SCI is lower than that in the non-SCI. Therefore, women with SCI need to be aware of their baseline blood pressure to help in monitoring during pregnancy. Initiation of medication as simple as iron tablet should be monitored as it could worsen constipation.⁶

In general, female sex and pregnancy is a known risk factor for urinary tract infection (UTI). SCI individuals have significantly higher risk of UTI along the course of pregnancy.^{3,5} The risk is higher by 37% when compared to pre-injury pregnancy.³ As bladder dysfunctions are among the most common presentation in spinal cord-injured individuals, the method of choice in managing the issue significantly affects the rate of UTI.⁸ Our patient did not present with UTI during pregnancy. She was on continuous bladder drainage with regular bowel evacuation. As there is no evidence-based treatment to date,⁹ possible interventions to improve the condition are (1) use of least invasive bladder drainage methods, for example, intermittent

catheterization compared to indwelling catheterization,⁸ (2) use of hydrophilic-coated compared to non-hydrophilic catheters,¹⁰ (3) minimizing incomplete bladder drainage,⁶ thus some may need to change bladder program or increase frequency of catheterization and (4) regular urinalysis for early detection of significant bacteriuria.⁶ Salomon *et al.*¹¹ investigated prophylactic antibiotic treatment for UTI in six pregnant SCI individuals with significant reduction of infection and the uncomplicated term fetus. However, to date, there is no definite recommendation on usage of antibiotic except when symptomatic UTI is diagnosed.⁶

Study on pregnant women with SCI found that weight gain affects functional ability in 15% of the respondents and 6% developed new pressure ulcer.³ Our patient experienced the same problem when she needed help during transfer later in her pregnancy. Fortunately, she was still able to be independent in other aspects of self-care and denied worsening of her pressure ulcer during the pregnancy. Prevention strategy for pressure ulcer should be emphasized, including wheelchair assessment to ensure good fitting and good seating system, reinforcement on the pressure relieve technique, which most probably requires modification and regular skin check.⁶

Impaired sensation makes the presentation of labor in SCI unique. They commonly complain of pain either above the level of injury or a non-specific pain, rupture of membrane, occurrence of autonomic dysreflexia (AD), increased bladder spasm or increased spasticity without other obvious cause.^{3,6} Therefore, daily vaginal examination should be advocated from 32 weeks of pregnancy.¹² Although relative number of women with SCI may experience the same labor symptoms as non-SCI women do,³ Robertson & Guttman recommended vaginal examination in those with level T10 and above as abdominal will not differ from Braxton-Hicks contractions.¹³ Our patient did not have any symptom even during active labor.

Half of the women with SCI do not require analgesia during labor.³ However, when indicated especially to prevent AD, regional analgesia is proven effective.¹⁴ AD management during labor will require thorough assessment to remove the noxious stimuli, positioning, close monitoring of blood pressure and conventional management using fast-acting antihypertension when all failed.¹⁴ Due to the concern of pure AD during labor, cesarean delivery is not a recommended method of delivery,^{6,14} except for poor hypertension control despite maximum effort.⁶ Early anticipation and preventive intervention is crucial.⁶

More than half of the women with SCI successfully delivered vaginally (61.4%),³ either spontaneously or assisted with vacuum

or forceps. Cesarean section rate is higher by 9.5% when compared to pre-injury status; however, there is no further elaboration on the indication except for higher fetal malpresentation and prolonged second stage.³ Morton *et al.*⁵ statistically demonstrated that the increment in cesarean delivery is not significant. Precaution should be imposed on regular turning to prevent development of pressure ulcer.⁶ Women with SCI were also found to have higher rate of premature labor and delivery by 8.6%, and higher rate of low-birth-weight baby by 9.1%,³ which was found to be inter-related and associated with higher incidence of UTI.⁵

Post-partum complications seem to be comparable to those in the non-SCI women.^{3,5} Unfortunately, the rate of breastfeeding was found to be lower in SCI mothers despite its well-known benefits. As in our patient, she had a period of short breastfeeding, which did not differ from her first pregnancy. In addition, she expressed the difficulty in taking care of her baby, although this can be prevented by reassessing her equipment and appropriate modification and adaptation.

CONCLUSION

Pregnancy is relatively safe in women with spinal cord injury (SCI). However, disability-related issues can be exaggerated during pregnancy, delivery and post-partum periods. Thus, understanding common issues related to pregnancy in this population is important. Specialized obstetric care with rehabilitation input throughout antenatal and postnatal care is crucial for the overall outcome of a pregnant woman with SCI.

COMPETING INTERESTS

The authors declare no conflict of interest.

REFERENCES

- 1 Tan HB, Sloan JP, Barlow IF. Improvement in initial survival of spinal injuries: a 10-year Audit. *Injury* 2005; **36**: 941–945.
- 2 Strauss DJ, DeVivo MJ, Paculdo DR, Shavelle RM. Trends in life expectancy after spinal cord injury. *Arch Phys Med Rehabil* 2006; **87**: 1079–1085.
- 3 Jackson AB, Wadley V. A multicenter study of women's self-reported reproductive health after spinal cord injury. *Arch Phys Med Rehabil* 1999; **80**: 1420–1428.
- 4 Oshima S, Kirschner KL, Heinemann A, Semick R. Assessing the knowledge of future internists and gynecologists in caring for a woman with tetraplegia. *Arch Phys Med Rehabil* 1998; **79**: 1270–1276.
- 5 Morton C, Le JT, Shahbandar L, Hammond C, Murphy EA, Kirschner KL. Pregnancy outcomes of women with physical disabilities: a matched cohort study. *PM R* 2013; **5**: 90–98.
- 6 Baker ER, Cardenas DD. Pregnancy in spinal cord injured women. *Arch Phys Med Rehabil* 1996; **77**: 501–507.
- 7 Cross LL, Meythaler JM, Tuel SM, Cross AL. Pregnancy, labor and delivery post spinal cord injury. *Paraplegia* 1992; **30**: 890–902.
- 8 Ruz AED, Leoni EG, Cabrera RH. Epidemiology and risk factors for urinary tract infection in patients with spinal cord injury. *J Urol* 2000; **164**: 1285–1289.
- 9 Pannek J, Bertschy S. Mission impossible? urological management of patients with spinal cord injury during pregnancy: a systematic review. *Spinal Cord* 2011; **49**: 1028–1032.
- 10 Li L, Ye W, Ruan H, Yang B, Zhang S, Li L. Impact of hydrophilic catheters on urinary tract infections in people with spinal cord injury: systematic review and meta-analysis of randomized controlled trials. *Arch Phys Med Rehabil* 2013; **94**: 782–787.
- 11 Salomon J, Schnitzler A, Ville Y, Laffont I, Perronne C, Denys P *et al*. Prevention of urinary tract infection in six spinal cord-injured pregnant women who gave birth to seven children under a weekly oral cyclic antibiotic program. *Int J Infect Dis* 2009; **13**: 399–402.
- 12 Rossier AB, Ruffieux M, Ziegler WH. Pregnancy and labour in high traumatic spinal cord lesions. *Paraplegia* 1969; **7**: 210–216.
- 13 Robertson DNS, Guttmann L. The paraplegic patient in pregnancy and labour. *Proc R Soc Med* 1963; **56**: 381–387.
- 14 Krassioukov A, Warburton DE, Teasell R, Eng JJ. A systematic review of the management of autonomic dysreflexia following spinal cord injury. *Arch Phys Med Rehabil* 2009; **90**: 682–695.