

Table 21. Impaired Lactation After SCI

Author Year; Country Score Research Design Total Sample Size	Methods	Results
<p>Rasul & Biering-Sorenson 2015 Denmark Cross-sectional Level 5 N=62</p>	<p>Population: Parents with SCI (n = 26 female; n = 36 male). Ages 29-72 (mean 48.1 years) at time of survey; age at first childbirth if after SCI was 21-54, mean 32.5 years. 56% had paraplegia and 44% had tetraplegia (no other information collected on SCI). Treatment: None Outcome measures: Questionnaire results.</p>	<ol style="list-style-type: none"> 1. 17 out of 26 women (65.4%) could breastfeed without aids and there was no difference between paraplegia and tetraplegia. 1. Authors acknowledge that tetraplegia is expected to have impaired lactation due to absent sympathetic innervation and suggests their findings are due to the small sample
<p>Rutberg et al. 2008 Sweden Cohort study Level 2 N=16</p>	<p>Population: 16 women with acute SCI (sustained 30 days before s-PRL was sampled). Mean age at injury 44.8 years (range 20-79). SCI in C1-L5, AIS A-D. 7 in menopause, 6 had amenorrhea after SCI (but otherwise normal gynecological history), 3 normal gynecological history, 0 were pregnant or postpartum. Treatment: None Outcome measures: s-PRL test</p>	<ol style="list-style-type: none"> 1. No galactorrhea in participants. 2. Hyperprolactinaemia was found in women of childbearing age (n=9) but not in menopause (n=7); hyperprolactinaemia was strongly associated with amenorrhea in 6 women of childbearing age within 6 months of injury. 3. No correlation between s-PRL levels and SCI level or degree, so transient increase in PRL attributed to stress response rather than pituitary trauma.
<p>Cowley 2005 Canada Case Series Level 4 N=3</p>	<p>Population: 3 women with tetraplegia. SCI was sustained 12 years before childbirth for participant 1 and 9 years prior for participant 2. Participant 3 was injured while pregnant with her second child. SCI in C6-8 with AIS A, B. Treatment: None Outcome measures: ability to elicit let-down reflex, ability to breastfeed</p>	<ol style="list-style-type: none"> 1. The 3 women were able to elicit the let-down reflex, and breastfeed even with high-level SCI, using mental imaging or pharmacological treatment. 2. Participant 1 used mental imaging to induce the let-down reflex and breastfeed her twins for 52 weeks and third child for 54 weeks. 3. Participant 2 required oxytocin nasal spray to induce let-down and breastfed for 6 months. 4. Participant 3 breastfed her first child (born before sustaining SCI) for 9 months. She breastfed her second child (born after sustaining SCI) for 3 months.

<p>Craig 1990 USA Case Series Level 4 N=9</p>	<p>Population: A total of 13 pregnancies across 9 women with SCI (n=8) or paralysis due to polio (n=1). At the time of study, women were 27-48 years old (mean 34.66 years). SCI in C4-T12 (AIS unknown). SCI at or above T6 (n=4) or below T6 (n=4). Treatment: None Outcome measures: pregnancy, labour, and postpartum experiences</p>	<ol style="list-style-type: none"> 1. The 4 women with SCI at or above T6 noted a decrease in milk production 6 weeks postpartum. 2. The women with low SCI did not report any lactation difficulties, leading the author to conclude that lactation may be impaired in women with high-level SCI (above T6).
<p>Berezin et al. 1989 Israel Case series Level 4 N=6</p>	<p>Population: 6 (out of 61) SCI patients with previously normal menstruation who developed transient galactorrhea-amenorrhea syndrome after traumatic dorsal/lumbar SCI. Aged 15-50 years. T4, T6, T12, L5. AIS not reported. Treatment: bromocriptine Outcome measures: PRL test, galactorrhea and menstruation presence</p>	<ol style="list-style-type: none"> 1. All women had elevated PRL 3-4 weeks post-injury. 2. 4 women received bromocriptine, which normalized PRL, galactorrhea, and menstruation. 3. PRL in untreated patients gradually normalized over 12 months. Cessation of galactorrhea and restoration of menstruation occurred sooner. 4. Higher lesions (T4, T6) were associated with longer, more severe galactorrhea-amenorrhea and highest levels of PRL.
<p>Yarkony et al. 1992 USA Case series Level 4 N=4</p>	<p>Population: 4 women with thoracic paraplegia aged 19-30 years. SCI in T3-T11, AIS A and B. 1 had never been pregnant. 3 had given birth 2-7 years before SCI; 1 became pregnant 34 months after onset. All were previously on medications (dopamine (DA) antagonists, H2-receptor (H2-R) blockers, tricyclic antidepressants (TCAs) or a combination). Treatment: discontinuing metoclopramide and other medications. Outcome measures: Galactorrhea, PRL levels</p>	<ol style="list-style-type: none"> 1. Galactorrhea occurred one to five months after SCI and persisted for 22-34 months (exact duration unknown because some declined treatment and may have been lost to follow-up). 2. Discontinuing metoclopramide (DA antagonist) resolved galactorrhea and slightly elevated PRL in a nulliparous woman with slightly elevated PRL. 3. Discontinuing all other medications (DA antagonists, H2-R blockers, TCAs) did not alleviate hyperprolactinemia or galactorrhea for two others who declined treatment. 4. One woman had normal PRL and galactorrhea which ceased at 22 months without treatment (unknown if related to discontinuing H2-R blockers and TCAs which did not immediately have an effect).

<p>Robertson et al. 1972 United Kingdom Case Series Level 4 N=26</p>	<p>Population: 26 women with paraplegia and tetraplegia who delivered a total of 39 babies. Traumatic paraplegia (n=20). Other causes of paralysis were spinal cord disease (n=4) and poliomyelitis (n=2). C4-5 was the highest level of traumatic tetraplegia; T3 reported in the only woman who was injured during pregnancy.</p> <p>Treatment: None</p> <p>Outcome measures: let down reflex, breastfeeding ability</p>	<ol style="list-style-type: none"> 1. All women were able to breastfeed their infants and experienced the let-down reflex.
<p>Holmgren et al. 2018 Canada and Sweden Retrospective Cross-Sectional Survey Level 5 N=52</p>	<p>Objective: This study aimed to identify major barriers to lactation and breastfeeding related to spinal cord injury, specifically comparing high- and low-level injuries.</p> <p>Population: N=52 (52F), Mean maternal age: 31.94, 22 Cervical, 21 Thoracic, 9 Lumbar, 20 Tetraplegic, 32 Paraplegic</p> <p>Methodology: Two online questionnaires were developed and completed by women who chose to breastfeed with spinal cord injury</p> <p>Outcome Measures: Breastfeeding</p>	<ol style="list-style-type: none"> 1. Women with high-level injury had insufficient milk production or ejection (p<0.01). 2. Duration of breastfeeding was shorter in high-level injury groups (p<0.05). 3. There was difficulty in positioning and insufficient milk production but high-level injury had greater difficulty (p<0.05).