

1 **Title**

2 Somatic symptom disorder manifested as acute abdominal pain during pregnancy preceding perinatal  
3 depression: a case report

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6 **Keywords**

7 somatic symptom disorder; postpartum depression; perinatal mental health; abdominal pain during  
8 pregnancy

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1           Somatic symptom disorder (SSD) occurring as abdominal pain during pregnancy can be very  
2 difficult to distinguish from physical diseases; prompt diagnosis and appropriate treatment are  
3 required. SSD can develop into perinatal depression, which may need intensive psychiatric  
4 intervention. Here, we present the first case report of SSD preceding perinatal depression. This case  
5 shows the clinical importance of SSD in obstetrics both as a cause of abdominal pain and as a  
6 precursor of depression.

## 1 Introduction

2

3 Abdominal pain during pregnancy is always a challenge for obstetricians (Sharp 2002). There  
4 are cases of acute abdomen, which has an incidence of 1 in 500–635 pregnancies and usually  
5 requires surgical treatment (Augustin and Majerovic 2007). Pain caused by threatened preterm labor  
6 or constipation is very common and relatively easy to manage, whereas pain caused by abdominal  
7 diseases not related to pregnancy such as appendicitis, cholecystitis, and malignancies can widely  
8 vary and be challenging (Table 1). There can be severe and advanced cases resulting in poor fetal  
9 and maternal outcomes; thus, it is important for obstetricians to consider as many diseases as  
10 possible in the differential diagnosis for abdominal pain during pregnancy. However, proper  
11 assessment of psychiatric diseases by doctors other than psychiatrists tends to be difficult. Therefore,  
12 pain that results from a psychiatric condition may be underestimated or even recognized as  
13 non-pathological.

14 A somatic symptom disorder (SSD), formerly referred to as a somatoform disorder, is a mental  
15 disorder diagnosed when a patient has severe disabling physical pain that cannot be sometimes  
16 explained by physical examination or attributed to any other mental disorder (American Psychiatric  
17 Association 2013). Somatization itself results from an interaction between the mind and body and is  
18 not necessarily pathological. Owing to its nature, its diagnosis and appropriate treatment are often  
19 very difficult; it can be associated with or influenced by other psychiatric diseases such as depressive

20 and anxiety disorders (Kelly et al. 2001). Although medications such as painkillers and  
21 antidepressants and approaches such as cognitive behavioral therapy have been applied, there is no  
22 established treatment yet. SSD can occur in pregnant women, and it can become a serious issue.  
23 Few reports have indicated an association between somatization and postpartum depression  
24 (Bergink et al. 2011; Caparros-Gonzalez et al. 2017). However, to the best of our knowledge, there  
25 has been no report focusing on SSD during pregnancy.

26 Here, we report the detailed clinical course of a case of SSD during pregnancy. This case  
27 shows the clinical importance of SSD in obstetrics both as an antecedent disease to postpartum  
28 depression and as an important differential diagnosis for acute abdomen during pregnancy.

29

### 30 **Case report**

31

32 A 37-year-old nulliparous Japanese woman without any psychiatric history achieved pregnancy  
33 with the support of clomifene and human chorionic gonadotropin. After finding out about her  
34 pregnancy, she visited a local obstetrician for severe squeezing pain in her lower abdomen. No other  
35 symptoms such as diarrhea or vomiting were noted. Her pain worsened as her pregnancy proceeded.  
36 At 28 weeks of pregnancy, she was referred to our hospital, which is one of the tertiary perinatal  
37 centers in central Japan. At that time, she was afebrile, and her laboratory examination and obstetric  
38 ultrasonography showed no abnormal findings (cervical length of 34 mm). Ritodrine for tocolysis was

39 started as a diagnostic treatment although tocogram showed only weak uterine contractions.  
40 Additionally, magnesium oxide and Daikenchuto as antiflatulent agents, and acetaminophen for pain  
41 relief were administered, but there was no improvement. At 29 weeks of pregnancy, her pain became  
42 so severe that she called nurses very frequently and wanted to undergo delivery. Besides, she had  
43 suicidal feelings. Magnetic resonance imaging, gastroscopy, colonoscopy, and urological  
44 ultrasonography could not identify the cause of her pain. Acute porphyria, autoimmune disease, and  
45 urinary malignancy were excluded. Only the administration of olanzapine, which is one of  
46 antipsychotics widely used for schizophrenia and bipolar disorder, was effective and made her pain  
47 milder. A multidisciplinary conference was held, and her pain was considered to be associated with a  
48 pathological mental state that was expressed as a somatic symptom. She was diagnosed with SSD,  
49 which was more specifically associated with a sub-category of a pain disorder. Although she had  
50 extreme anxiety, she experienced some relief after receiving sufficient explanation about her  
51 condition, and she resumed follow-up in the outpatient obstetric department. Her psychiatric  
52 follow-up was performed in parallel on the same days as her prenatal check-ups. At 40 weeks of  
53 pregnancy, she was admitted because of the onset of labor, and she delivered a healthy boy  
54 weighing 3,048 g.

55 In puerperium, her physical course was good, but her mental course was poor. On the 7th day  
56 after delivery, her husband called us for help because she had shut her room, seemed out of energy,  
57 and said that she did not want to be with her son or even look at her son's face. She was taken to a

58 psychiatrist at our hospital. She complained of insomnia, restlessness, mild continuous abdominal  
59 pain, and negative feelings toward her son. Finally, she was diagnosed with severe perinatal  
60 depression. She was prescribed mirtazapine (an antidepressant, 15 mg/day) and lorazepam (an  
61 anxiolytic, 0.5 mg; according to request) in addition to olanzapine (already prescribed), which was  
62 gradually tapered off and discontinued at 10 weeks postpartum. Mirtazapine was replaced with  
63 escitalopram oxalate (an antidepressant) and eszopiclone (a hypnotic) on her request because of  
64 weight gain at 36 weeks postpartum, and eszopiclone was replaced with trazodone hydrochloride  
65 (an antidepressant) because of the side effect of headache at 45 weeks postpartum. Her depression  
66 needed long-term follow-up, which ended at 19 months postpartum with her depression in a  
67 remission state.

68

## 69 **Discussion**

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71 The present case highlights two points of clinical importance. First, SSD should be considered in  
72 the differential diagnosis of abdominal pain during pregnancy. Second, SSD can progress to  
73 perinatal depression.

74 SSD has an estimated prevalence of 19% in adults (American Psychiatric Association 2013),  
75 and they could occur with acute abdominal pain during pregnancy, as in the case of our patient.  
76 Although their prevalence during pregnancy has not been reported, it is believed to be higher than

77 that in the general population, considering multiple physical burdens associated with pregnancy  
78 (Otchet et al. 1999) and a possible sex difference in the pathophysiology of SSD (Bitzer 2003).  
79 Abdominal pain during pregnancy can sometimes be difficult to diagnose. In most cases, it is due to  
80 common pregnancy complications such as threatened preterm labor, which would be relieved by  
81 tocolysis, and constipation. It may involve obstetrical emergencies and non-obstetrical acute  
82 abdomen, which require prompt diagnosis and treatment. Placental abruption and uterine rupture are  
83 obstetrical emergencies that threaten the lives of both the pregnant woman and her baby, and  
84 obstetricians are always alert with regard to these issues. On the other hand, acute abdomen is often  
85 very difficult to accurately diagnose and properly manage. It is mainly because imaging studies such  
86 as ultrasonography and computed tomography (CT) may not be appropriate owing to a distended  
87 uterus and unavailability of contrast agent. CT imaging might be rejected by pregnant women for fear  
88 of possible harm to their babies, and doctors may be reluctant to perform possibly unnecessary  
89 examinations or treatments in pregnant women (Augustin and Majerovic 2007). When imaging and  
90 laboratory examinations fail to explain abdominal pain, the situation can become very confusing, and  
91 the condition might be judged as “nothing particular.” It is very difficult to know whether the pain  
92 originates from some organic abnormality or some inappropriate mental state such as SSD. SSD  
93 should be included in the differential diagnosis of unexplained abdominal pain during pregnancy to  
94 avoid possibly adverse unnecessary examinations or treatments, including enhanced CT imaging,  
95 medication trial, and exploratory surgery, for the safety of both the pregnant woman and her child.



96           SSD develops into or is followed by depression because somatic symptoms themselves are  
97 important risk factors of depression. Thus, obstetricians should be careful of the development of  
98 perinatal depression secondary to or complicating SSD. The relationship between SSD and  
99 depression has not been established till date, partly because of their overlapped patient population  
100 and transition of the SSD definition. However, SSD and the increasing mental burden of pregnancy,  
101 delivery, and childbearing can synergistically induce a depressive state, as was noted in our case.  
102 Bergink et al. (2011) reported that the Edinburgh Depression Scale has high validity with  
103 somatization subscales in the Symptom Checklist 90. Caparros-Gonzalez et al. (2017) reported that  
104 somatization, especially in the first and second trimesters of pregnancy, can predict postpartum  
105 depression. SSD can be so severe that it may drive patients to attempt suicide without clear  
106 expression of their emotional disturbances (Kampfer et al. 2016). To date, there has been no  
107 standard intervention for mental disorders during pregnancy, including SSDs and perinatal  
108 depression. However, antipsychotics and other psychotropic drugs can be effective for treatment as  
109 in our case, and a recent meta-analysis suggested that cognitive behavioral therapy, body-oriented  
110 therapy, and acupuncture may be effective approaches (van Ravesteyn et al. 2017). When SSD is  
111 followed by perinatal depression, the situation can become very complicated, and close coordination  
112 is essential among obstetricians, psychiatrists, and other associated co-medical workers. In addition,  
113 infertility treatment might have had some influence on the pathogenesis of SSD and perinatal  
114 depression in our case. However, the association is yet controversial; some papers are in favor of

115 (Monti et al. 2009) and others are against it (Gressier et al. 2015).

116 In conclusion, our case showed that SSD should be recognized as an important cause of acute  
117 abdominal pain during pregnancy and that it is a possible precursor of perinatal depression. SSD  
118 should be kept in mind not only by psychiatrists but also by obstetricians and obstetrical care  
119 providers.

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### 121 **Compliance with ethical standards**

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123 **Conflicts of interest** The authors declare that they have no conflicts of interest.

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### 125 **References**

126

127 American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders, fifth edition.

128 American Psychiatric Association Publishing Arlington

129 Augustin G, Majerovic M (2007) Non-obstetrical acute abdomen during pregnancy Eur J Obstet Gynecol

130 Reprod Biol 131:4-12 doi:10.1016/j.ejogrb.2006.07.052

131 Bergink V, Kooistra L, Lambregtse-van den Berg MP, Wijnen H, Bunevicius R, van Baar A, Pop V (2011) Validation

132 of the Edinburgh Depression Scale during pregnancy J Psychosom Res 70:385-389

133 doi:10.1016/j.jpsychores.2010.07.008

134 Bitzer J (2003) Somatization disorders in obstetrics and gynecology Arch Womens Ment Health 6:99-107

135 doi:10.1007/s00737-002-0150-6

136 Caparros-Gonzalez RA, Romero-Gonzalez B, Strivens-Vilchez H, Gonzalez-Perez R, Martinez-Augustin O,

137 Peralta-Ramirez MI (2017) Hair cortisol levels, psychological stress and psychopathological symptoms

138 as predictors of postpartum depression PLoS One 12:e0182817 doi:10.1371/journal.pone.0182817

139 Gressier F, Letranchant A, Cazas O, Sutter-Dallay AL, Falissard B, Hardy P (2015) Post-partum depressive

140 symptoms and medically assisted conception: a systematic review and meta-analysis Hum Reprod

- 141 30:2575-2586 doi:10.1093/humrep/dev207
- 142 Kampfer N et al. (2016) Suicidality in patients with somatoform disorder - the speechless expression of anger?  
143 Psychiatry Res 246:485-491 doi:10.1016/j.psychres.2016.10.022
- 144 Kelly RH, Russo J, Katon W (2001) Somatic complaints among pregnant women cared for in obstetrics: normal  
145 pregnancy or depressive and anxiety symptom amplification revisited? Gen Hosp Psychiatry  
146 23:107-113
- 147 Monti F, Agostini F, Fagandini P, La Sala GB, Blickstein I (2009) Depressive symptoms during late pregnancy and  
148 early parenthood following assisted reproductive technology Fertil Steril 91:851-857  
149 doi:10.1016/j.fertnstert.2008.01.021
- 150 Otchet F, Carey MS, Adam L (1999) General health and psychological symptom status in pregnancy and the  
151 puerperium: what is normal? Obstet Gynecol 94:935-941
- 152 Sharp HT (2002) The acute abdomen during pregnancy Clin Obstet Gynecol 45:405-413
- 153 van Ravesteyn LM, Lambregtse-van den Berg MP, Hoogendijk WJ, Kamperman AM (2017) Interventions to treat  
154 mental disorders during pregnancy: A systematic review and multiple treatment meta-analysis PLoS  
155 One 12:e0173397 doi:10.1371/journal.pone.0173397
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1 **Acknowledgement**

2 We would like to thank Enago ([www.enago.jp](http://www.enago.jp)) for the English language review.

Table 1 The differential diagnosis for acute abdomen during pregnancy.

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Obstetrical

Miscarriage, Ectopic pregnancy, Threatened preterm labor, Uterine rupture, Placental abruption

Gynecological

Pelvic inflammatory disease, Rupture/Torsion of ovarian tumor, Ovarian bleeding,  
Degeneration/Torsion of uterine fibroid, Malignant tumors

Others

Gastroenterological

Appendicitis, Cholecystitis, Diverticulitis, Gastritis, Enteritis, Pancreatitis, Gastrointestinal perforation, Gastrointestinal tumor, Intestinal obstruction (ileus), Constipation, Irritable bowel syndrome, Malignant tumors

Urogenital

Urolithiasis, Renal infarction, Pyelonephritis, Malignant tumors

Hematological

Acute porphyria, Thalassemia, Leukemia

Vascular

Mesenteric arterial embolism, Dissection of the aorta/superior mesenteric artery

Trauma in the abdomen

Hematoma in rectus abdominis muscle

Extra-abdominal

Acute coronary syndrome, Pulmonary embolism, Pneumonia

Psychiatric

Somatic symptom disorder, Major depression disorder/Perinatal depression, Conversion disorder

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