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## SCIENTIFIC ARTICLE

# Ultrasound-guided versus surgical transversus abdominis plane block in obese patients following cesarean section: a prospective randomised study



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### KEYWORDS

Transversus abdominis  
plane block;  
Cesarean section;  
Pregnant women;  
Visual analogue scale;  
Analgesia

### Abstract

**Background and objectives:** Ultrasound-guided transversus abdominis plane block demonstrated efficacy in providing post-operative analgesia by prolonging the time to first analgesic requirement and reducing the total analgesic consumption. The surgical transversus abdominis plane block, a novel technique, can be performed safely in obese patients in whom muscle layers cannot be sufficiently exposed. Here, we compared applicability, efficacy and complications of surgical transversus abdominis plane and ultrasound-guided transversus abdominis plane blocks in obese pregnant women following cesarean section under general anesthesia.

**Methods:** Seventy-five pregnant women with pre- and post-pregnancy body mass index > 30 were randomized and allocated into two groups: Ultrasound-guided transversus abdominis plane block (UT group;  $n = 38$ ) and surgical TAP block (ST group;  $n = 37$ ). Visual analogue scale scores at post-operative 0, 2, 6, 12 and 24 hours (h), time to first analgesic requirement, total analgesic consumption amount in 24 h, post-operative side effects, complications and patient satisfaction were recorded.

**Results and conclusions:** Age, American Society of Anesthesiologist score, operative duration, body mass index, mean time to first analgesic requirement and total analgesic consumption in 24 h were similar between groups, while significant differences in pre- and post-pregnancy body mass index were observed between groups. Block procedure durations were 7 and 10 minutes in ST and UT groups, respectively. No significant differences in visual analogue scale scores

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**PALAVRAS-CHAVE**

Bloqueio do plano transverso abdominal;  
Cesariana;  
Grávidas;  
Escala visual analógica;  
Analgésia

were observed between the groups at all times; itching and nausea was observed in one (UT group) and four (UT and ST groups) patients, respectively. Surgical transversus abdominis plane block was safe in obese pregnant patients and provided similar post-operative analgesia to ultrasound-guided transversus abdominis plane block.

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**Bloqueio cirúrgico do plano transverso abdominal versus guiado por ultrassom em pacientes obesas após cesárea: estudo prospectivo e randomizado****Resumo**

*Justificativa e objetivos:* O bloqueio do plano transverso abdominal (TAP) guiado por ultrassom (US) demonstrou eficácia no fornecimento de analgesia no pós-operatório ao prolongar o tempo até a primeira necessidade de analgésico e reduzir o consumo total de analgésico. O bloqueio TAP cirúrgico (uma nova técnica) pode ser realizado com segurança em pacientes obesas nas quais as camadas musculares não podem ser suficientemente expostas. Comparamos a aplicabilidade, a eficácia e as complicações do bloqueio TAP cirúrgico e do bloqueio TAP-US em gestantes obesas submetidas à cesárea sob anestesia geral.

*Método:* Setenta e cinco mulheres grávidas com índice de massa corporal (IMC) pré e pós-gravidez > 30 foram randomicamente alocadas em dois grupos: bloqueio TAP-US (Grupo TAP-US,  $n = 38$ ) e bloqueio TAP cirúrgico (Grupo TAP-C,  $n = 37$ ). Os escores da escala visual analógica (VAS) nos tempos 0, 2, 6, 12 e 24 horas de pós-operatório, o tempo até a primeira necessidade de analgésico, o consumo total de analgésico em 24 horas, os efeitos colaterais no pós-operatório, as complicações e a satisfação do paciente foram registrados.

*Resultados e conclusões:* Idade, estado físico ASA, tempo cirúrgico, IMC, média de tempo até a primeira necessidade de analgésico e consumo total de analgésico em 24 horas foram semelhantes entre os grupos, enquanto diferenças significativas foram observadas entre os grupos em relação ao IMC pré- e pós-gravidez. As durações dos procedimentos de bloqueio foram 7 e 10 minutos nos grupos TAP-US e TAP-C, respectivamente. Não houve diferença significativa nos escores VAS entre os grupos em todos os momentos; prurido e náusea foram observados em um paciente (Grupo TAP-US) e em quatro (Grupo TAP-C), respectivamente. O bloqueio TAP cirúrgico foi seguro nas pacientes grávidas obesas e forneceu analgesia similar à do bloqueio TAP-US no pós-operatório.

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**Introduction**

Adequate pain control following cesarean section provides benefits to mothers and infants and facilitates early rehabilitation and mobilisation of the mother, thereby preventing thromboembolic events and allowing early breastfeeding.<sup>1,2</sup> Although the use of opioids with neuraxial block is preferred because it provides efficient post-operative analgesia following cesarean section, multimodal analgesia protocols including Patient-Controlled Analgesia (PCA) with opioids, paracetamol or Non-Steroidal Inflammatory Drugs (NSAIDs) have also been used with a neuraxial block and, generally, under anesthesia conditions in which the use of a neuraxial block is restricted.<sup>3,4</sup> Despite the substantial efficacy of opioids as analgesic agents, they cause maternal side effects, including nausea, vomiting, sedation, pruritus and respiratory depression. Because neonatal side effects occur via placental transmission, peripheral nerve blocks

and infiltration, recently, methods that use lesser amounts of opioids have been developed as a part of multimodal analgesia protocols.<sup>5</sup> The use of the classic Transversus Abdominis Plane block (TAP), a block commonly used for post-operative analgesia following lower abdominal surgery, was first described by Rafi in 2001 and involves blockade of the T7–L1 intercostal, subcostal, ilioinguinal and iliohypogastric nerves that provide sensory innervation to the anterior abdominal wall. The technique involves analgesic agent introduction into the lateral abdominal wall and between the internal oblique and transversus abdominis muscles (termed as TAP).<sup>6</sup> The classic blind method is associated with several complications<sup>7</sup>; therefore, it has largely been replaced by Ultrasound-Guided (USG) TAP, first described by Hebbart et al.,<sup>8</sup> because fewer complications are encountered with USG-TAP.<sup>9,10</sup> USG-TAP blocks performed under general anesthesia or a neuraxial block have efficacy in providing post-operative analgesia by prolonging

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