Secondly, in Table 2 of the commented paper [1], lactate concentration was classified as one criteria of Systemic Inflammatory Response Syndrome (SIRS), as a matter of fact, though blood lactate is vital in the diagnosing and treating of sepsis, blood lactate is not a part of SIRS [3] all the time, incorporating blood lactate as one criteria of SIRS will make it easier to achieve ≥2 SIRS criteria and thus generate more patients with 'sepsis'. Furthermore, the percent of immature neutrophils ("bands") is one criteria of SIRS but omitted by Table 2.

Thirdly, there had not been a golden standard for sepsis existed though the international definition for sepsis had gone through 3 versions (Sepsis 1.0 [3], Sepsis 2.0 [4] and Sepsis 3.0 [2]) from 1991 to 2016, the newest version (Sepsis 3.0) developed and recommended qSOFA score to prompt more rapid identification of sepsis, nevertheless, the commented paper [1] chose the SIRS criteria as its diagnostic criteria and investigated the ability of positive qSOFA in recognizing the 'septic' patients, in other words, the authors want to compare different diagnostic criteria for the same patients without golden standard existing as a reference, which just like putting new wine into old bottles, so what is the significance and value of doing like this? Our understanding of sepsis has gone further since 25 years has passed by, sepsis is now defined as life-threatening organ dysfunction caused by a dysregulated host response to infection which is associated with an in-hospital mortality ≧10% as per Sepsis 3.0 [2], while, in the article by Barbara et al. [1], 'sepsis' was associated with only 6.3% ED mortality per Sepsis 1.0 [3] or Sepsis 2.0 [4], thus the new criteria had an obvious superiority than the old criteria in picking out the patients who will have the highest morality, differentiating sepsis from uncomplicated infection and being in accord with the meaning of "life-threatening" [5].

Fourth, the 3 basic elements(RR, SBP and level of consciousness) of qSOFA score all can change with time, thus the time window of qSOFA score calculation is important, the original study [6] which developed qSOFA score chose the time window of '48 hours before to 24 hours after the onset of infection', however, the commented study [1] had no limits in the time window of qSOFA score calculation, thus we are afraid that qSOFA score might have a biased discerning power of 'sepsis'.

At last, we appreciate Barbara et al. for their innovative and meaningful study, but the interpretation of their work should be cautious and further rigorous studies are warranted.

Abbreviations

EMS	emergency medical services
qSOFA	quick sequential organ failure assessment
ED	emergency department
RR	respiratory rate
SBP	systolic blood pressure
SIRS	systemic inflammatory response syndrome

Declarations

Ethical approval and consent to participate

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Consent for publication

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Availability of supporting data

Not applicable.

Competing interests

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Emergency department utilization by newly pregnant adolescents: A community-based study

Teen pregnancy and birth rates in the United States remain among the highest of industrialized nations, with approximately 25% of girls becoming pregnant before age 20 [1]. Early diagnosis of pregnancy in this age group is of utmost importance. Adolescents are at an increased risk for many complications during pregnancy such as high blood pressure, anemia, having low birthweight babies and premature birth, and adolescents also tend to have lower rates of prenatal care [2, 3]. Delayed or absence of prenatal care for pregnant adolescents has been shown to correlate with higher rates of preterm birth, increased infant mortality rates, and other adverse pregnancy outcomes [4, 5]. Early detection and diagnosis of pregnancy in adolescents helps to decrease perinatal risks, and teenage women presenting to the emergency department (ED) with a variety of specific or nonspecific complaints should be routinely screened for pregnancy. Some teens may present with classic pregnancy symptoms of amenorrhea, nausea, vomiting, breast tenderness and/or weight gain, while others may present with vague symptoms suggestive of other ailments such as dizziness, abdominal pain, or simply feeling unwell [5]. Given the need to better understand and diagnose teen pregnancy in the ED, the primary objective of this

retrospective study was to 1) characterize the spectrum of complaints of newly pregnant adolescent females presenting to the ED and 2) determine the frequency of secondary diagnoses that might complicate prenatal care.

We conducted a retrospective cohort analysis of consecutive patients (ages 12–19) diagnosed as pregnant in the ED. The analysis included seven affiliated hospitals in West Michigan: three rural medical centers, three university-affiliated hospitals, and a children's tertiary care facility. Eligible cases were seen between January 2007 and August 2017 (127 months). Inclusion criteria were consecutive female patients (ages 12–19) diagnosed as pregnant in the ED. If a patient had multiple ED visits to any hospital during the study period, only 1 visit was included for review. Patients who presented with a known pregnancy were excluded. Demographic information, presenting complaints, laboratory results, and discharge diagnoses were obtained from ED records using an honest broker system. The honest broker is an individual who has access to the desired data and who is not involved as a listed researcher on the respective research study. The honest broker accesses the desired medical record information and provides the researcher with de-identified data or a limited data set. Descriptive statistics were used to describe the demographic variables and clinical findings, and 95% confidence intervals (CI) were used to quantify uncertainty.

A total of 116,531 consecutive adolescents presented to the ED during the study period; 2312 (1.9%) had positive pregnancy tests in the ED and met the inclusion criteria. The mean age was 17.8 ± 1.3 years; 336 patients (14.5%) were 16 years of age or younger. Two patients were 12 years old. The majority of the women were Caucasian (45.1%) followed by African-American (33.1%), and Hispanic (15.7%). Overall, 38.4% (95% CI, 36.4%–40.4%) did not have a primary care physician and 5.9% (95% CI, 5.0%–7.0%) did not have health insurance. Less than half of the study population (48.4%) mentioned the possibility of pregnancy at initial triage, and 5.1% reported a previous pregnancy. One third of patients (33.2%) could not estimate LMP. The majority of patients had presenting complaints referable to the abdomen or genitourinary system; however 10.4% (95% CI, 9.2%–11.7%) had non-specific symptoms (e.g., fatigue, headache, and myalgias) (Table 1). Thirty-nine adolescents (1.7%) visited the ED solely for a pregnancy test and 1038 (44.9%) had a pelvic exam performed. Duration of symptoms was 6.0 ± 5.5 days.

Overall, 98.1% of patients had a secondary diagnosis complicating pregnancy (Table 2). Of the 1042 adolescents that were screened for sexually transmitted infections (STI), 215 (20.6%) had at least one infection. Thirty-eight patients (1.6%) were admitted to the hospital. Reasons for admission included pyelonephritis (18), ectopic pregnancy (13), endometritis (5), and drug overdose (2). Three patients were transferred to a psychiatric hospital.

Pregnant adolescent patients presenting to an emergency department pose a unique challenge to the medical staff. Adolescents may be either unaware of the pregnancy or hesitant to admit it. This underscores the importance of administering pregnancy tests to pubescent females in the ED, even when the patient may not suspect she is pregnant. These teenagers can present to the emergency department with a wide variety of nonspecific complaints that may suggest other diagnoses. In our study, most adolescents (98%) had a secondary diagnosis complicating pregnancy, however only 1% required hospital admission. The majority of pregnant adolescents have a primary care physician and medical insurance, but they rely heavily on EDs for non-urgent medical care. Although rates of teen pregnancy have fallen in recent years, better education about pregnancy, prenatal care, and long-acting reversible contraceptive (LARC) methods is a must to help continue to decrease the incidence of teen pregnancy [6].

Table 1
Presenting complaints in newly pregnant adolescents presenting to the ED (N = 2312).

Abdominal/pelvic pain	1045 (45.2%)
Vaginal bleeding	382 (16.5%)
Nausea/vomiting	302 (13.1%)
Non-specific sx	241 (10.4%)
Urinary symptoms	79 (3.4%)
Wants pregnancy test	39 (1.7%)
Vaginal discharge	28 (1.2%)
Other	141 (6.1%)

Table 2
Secondary diagnosis complicating adolescent pregnancy (N = 2268).

Abdominal pain, unspecified	1091 (48.1%)
Urinary tract infection	916 (40.2%)
Threatened/missed AB	429 (18.9%)
Vaginal hemorrhage, unspecified	356 (15.7%)
Hyperemesis	262 (11.6%)
Nausea ± vomiting	242 (10.7%)
Vaginitis	226 (10.0%)
Sexually transmitted disease	215 (9.5%)
Ovarian cyst	123 (5.4%)
Dehydration	21 (0.9%)
Rule out ectopic	16 (0.7%)
Other	512 (22.6%)

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Managing unplanned severe opiate withdrawal after Vivitrol

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Having deliberately precipitated opiate withdrawal with naltrexone (NTX) in several thousand opiate-dependent patients, using a variety of techniques, between 1985 and my retirement two decades later, I think I can comment usefully on the difficulties experienced by Wightman et al. [1] in managing severe and unexpected opioid withdrawal precipitated by Vivitrol®. The drug that is notably absent from their attempts at symptom control is octreotide. Other researchers have confirmed my original observation [2] that it effectively prevents the profuse diarrhea and vomiting that distress medical and nursing staff as well as patients and it is now routine in most rapid NTX induction/transfer programmes [3,4]. 100–200 μg s/c or slow i/v is usually adequate for an average-sized patient. It can be repeated 8-hourly and may need to be continued for several days after initiating NTX; occasionally longer.

Most of my patients transferred seamlessly from opiates to NTX using techniques that did not involve general anaesthesia [5] but mainly after 1995, some 700 were treated in ICUs using a variety of anaesthetic techniques and agents. Dexmedetomidine was not then routinely available in Britain but i/v clonidine very effectively controlled both hypertension and tachycardia and has effective antidotes if BP or pulse-rate drops too far. I should add that the only (relatively minor) anaesthetic complication among those 700+ patients involved an ectopic bronchus, requiring re-intubation after chest x-ray.

In the sort of emergencies described in the paper, clonidine should be given i/v or at least i/m and usually in much larger doses than 100 μg. Many of my patients initiated NTX using an in-patient version of the 24-hour 'Asturian' NTX induction technique, developed originally in northern Spain as a domiciliary procedure without doctors or nurses [6]. It involves premedication with 450 μg of oral clonidine (as well as octreotide, other anti-emetics, gastro-protectants and oral midazolam) and a further 300 μg of clonidine an hour after administering 50 mg of oral NTX. Clonidine is a very safe drug.

The transient but sometimes profound restlessness and delirium that are usual in precipitated withdrawal can be managed by physical restraint but this may need two or three people. In the long-established Perth day-patient NTX induction programme [7] using modest levels of sedation with midazolam, family members or friends provide the muscle-power. In most ICUs, that is probably not acceptable but provided cardiovascular and gastrointestinal disturbances are well-controlled, the choice of anaesthetic is probably not very important. Intramuscular ketamine was sometimes used as an induction agent in patients with no easily accessible veins, allowing venous access to be obtained at leisure, and might be a suitable agent for quickly and safely controlling patients in acute withdrawal. My sole contribution to the anaesthetic literature was a paper describing its use for electro-convulsive treatment [8] in patients in a developing country who were often very psychotic by the time they arrived at the hospital. In subsequent correspondence, we noted that "…the induction of distraught, uncooperative or agitated patients was made considerably easier and less unpleasant for staff and patients" [9].

Antipsychotic drugs like haloperidol have little effect on the delirium of precipitated opiate withdrawal (or *delirium tremens*) and should be avoided. Prevention, by giving a naloxone challenge before Vivitrol, is obviously preferable. However, I also recall a newly-detoxified patient who showed no withdrawal response after successive doses of 400 μg and 800 μg of i/m naloxone but telephoned me 20 min after I then inserted a NTX implant to describe classic but fortunately relatively mild precipitated withdrawal symptoms.

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Dangerous manifestations of reversible cerebral vasoconstriction syndrome

The spectrum of dangerous manifestations of reversible cerebral vasoconstrictive syndrome (RCVS) includes, not only the subtype characterised by rapid-onset headache, as in the recently reported case [1], but also subtypes characterised by potentially life-threatening manifestations such as status epilepticus (SE) [2], and Guillain-Barre syndrome (GBS) [3, 4], respectively.

In one report, ten cases of SE were identified from a clinical database of 77 patients with RCVS (alternatively known as posterior reversible encephalopathy syndrome) in one university center [2]. Their mean age was 38.6 years (range 7 to 73 years). At the time of diagnosis of SE two patients had generalised convulsive SE, and eight had nonconvulsive SE with or only subtle clinical signs such as lip smacking and lateralised automatism, twitching, blinking, and spontaneous nystagmus. During the course of their hospital admission eight patients had generalised tonic-clonic seizures. Six patients responded to first line antiepileptic drugs. Four patients, however, developed refractory SE, and required general anaesthesia to control seizure activity. All ten patients eventually recovered from SE, along with resolution of imaging studies [2].

RCVS can also present with Guillain-Barre syndrome (GBS) [3] or its brainstem variant, Bickerstaff's brainstem encephalitis [4]. Guillain-Barre syndrome was reported in a previously healthy 63 year old woman initially presented with paresthesiae in both feet, and subsequent headache, bilateral visual loss, and hypertension. Magnetic resonance imaging (MRI) studies were consistent with a diagnosis of RCVS. Three days later she developed clinical features of GBS, complicated by respiratory failure requiring mechanical ventilation. Her symptoms improved only after plasmapheresis, and she was eventually weaned off the mechanical ventilation. Brain MRI performed 6 weeks after onset of her symptoms disclosed complete resolution of the abnormalities documented on admission [3]. The authors of the report documented eight other cases of RCVS-related GBS (age range 57–76) in the medical literature. They postulated that the association might be attributable to GBS-related dysautonomia that can lead to life-threatening arterial pressure instability and alteration in brain circulatory self-regulation.