Table 2 Benefits of isolated vitamin D supplementation found in systematic reviews.

Benefits described by Harvey et al.		
Birth weight	Observational	Combined regression coefficient, 5.63 g/10% of maternal vitamin D; 95% CI, 1.11–10.16 g[a]
Birth bone mass	Observational	5 of 8 OSs found a statistically significant association
Neonatal serum calcium levels	Meta-analysis	DM, 0.05 mmol/L; 95% CI, 0.02–0.05 mmol/L[a]
Benefits described by Palacios et al.		
Preeclampsia	Meta-analysis	RR, 0.48; 95% CI, 0.30–0.79; 4 RCTs[a]
Gestational diabetes	Meta-analysis	RR, 0.51; 95% CI, 0.27–0.97; 4 RCTs[a]
Low birth weight	Meta-analysis	RR, 0.55; 95% CI, 0.35–0.87; 5 RCTs[a]
Severe postpartum haemorrhage	Meta-analysis	RR, 0.68; 95% CI, 0.51–0.91; 1 RCT[a]
Preterm birth (< 37 W G)	Meta-analysis	RR, 0.66; 95% CI, 0.34–1.30; 7 RCTs

CI, confidence interval; DM, difference of means; OS, observational study; RCT, randomised clinical trial; RR, relative risk; WG, weeks of gestation.
[a] Statistically significant.

cautious in recommending isolated vitamin D supplementation during pregnancy, as the potential relationship of this practice with preterm birth has not been well established, although the relative risk is less than 1 and not statistically significant (Table 2).[6]

Given the above, and taking into account that the immigrant population in Spain is growing, we recommend suspecting VDD as a possible cause of neonatal hypocalcaemia, whether of early or late onset, routine screening of pregnant women for VDD and isolated vitamin D supplementation on a case-by-case basis based on the results, as the potential benefits to pregnant women and infants seems to outweigh the risks.

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Use of the subcutaneous route in a second level hospital. A review of current use and new proposals☆

Empleo de la vía subcutánea en un hospital de segundo nivel. Revisión del uso actual y nuevas propuestas

Dear Editor:

Subcutaneous access is an alternative route for delivery of fluids and drugs that has proven effective and is widely used in adults. Its use in the paediatric population has been limited to the administration of heparin, insulin and vaccines, but advances in the care of terminally ill paediatric patient have expanded the uses of subcutaneous access considerably.[1]

The aim of our study was to describe our experience with the use of subcutaneous access following the introduction of paediatric palliative care services in our hospital, to carry out a brief review of the current relevant literature and to propose possible additional uses of this route.

We conducted a retrospective and observational study of patients admitted to a secondary care hospital that underwent subcutaneous catheterization in year 2019.

The subcutaneous route was used in 5 patients, with a male-to-female ratio of 1.5:1, a median age of 6 months (range, 1 day–11 years) and a median weight of 4.9 kg (range, 2.1–16.9 kg). In every patient, the first attempt

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Table 1 Clinical characteristics of the 5 patients in the study and experience with subcutaneous catheterization.

Patient	Sex	Age	Disease	Ease of insertion (number of attempts)	Site of insertion	Change of catheter	Medication	Duration of catheterization (hours)	Complications
1	Male	2 years	Complex multiloculated hydrocephalus	1	Abdomen	No	Morphine Midazolam	20	None
2	Male	11 years	Joubert syndrome	1	Abdomen	No	Morphine Midazolam Scopolamine	31	None
3	Male	6 months	Very preterm Bronchopulmonary dysplasia	1	Abdomen	No	Morphine Midazolam	72	None
4	Female	1 day	Edwards syndrome	1	Abdomen	No	Morphine Midazolam	24	None
5	Female	5 months	Edwards syndrome	1	Abdomen	No	Morphine	16	None

of catheter insertion was successful, and the catheter was inserted in the abdomen. Subcutaneous access was used for delivery of medication, especially sedation and analgesia, in patients in the last days of life. The volume infused was small (mean, 1.5 mL/kg/h; maximum 3 mL/kg/h). None of the patients required a change in catheter, as all of them passed away before a change was due and none experienced complications associated with catheterization (Table 1).

The current evidence suggests that this route may be useful for delivery of medication or fluids for hydration. It offers significant advantages, including minimal complications and an effectiveness and safety similar to those of intravenous access. Infusion into the subcutaneous space is performed with a small-calibre needle that can be inserted into the thigh, abdomen, back or arm, depending on the age of the patient and the purpose of treatment.[1] The hypodermis has few pain receptors, has a substantial capacity to expand and is well vascularised, which allows administration of large volumes through it. It bypasses liver metabolism and offers a bioavailability similar to the one achieved with the intramuscular and intravenous routes, although the onset of action is somewhat slower. The technique is easily applied even with limited experience, is inexpensive and avoids potentially serious complications such as infection.[2,3] The main problems associated with its use are dislodgement of the needle or local reactions such as erythema, necrosis, crepitus or induration.[4] Other possible limitations depend on the type of drug or fluid being administered, the presence of electrolyte abnormalities, severe dehydration, changes in the skin barrier or blood disorders such as abnormal coagulation or thrombocytopaenia.

Different materials and techniques are used for subcutaneous catheterization. In our hospital, we use a disposable subcutaneous infusion set with 6 mm-long needles for paediatric patients and 9 mm-long needles for adult patients, as the insertion technique is simpler, it has an adhesive dressing that holds the set in place and the needle is housed in the device, which prevents accidental injuries. There are other subcutaneous infusion systems, butterfly needles or prefilled syringes used for administration of insulin in patients with diabetes with needles up to 4 mm long to minimise the risk of inadvertent intramuscular delivery. In the case of newborn infants, the use of devices with an angle of insertion in subcutaneous tissue of 45° should be considered.[2]

Several studies have analysed the use of the subcutaneous route as an alternative to the intravenous route, at least initially, in mildly or moderately ill children whose condition precludes the use of venous access or in which this approach fails or is complicated. Also, since subcutaneous access can be established quicker, this approach allows earlier initiation of treatment.[3] A study of subcutaneous rehydration in children found that the subcutaneous catheter was inserted successfully in the first attempt in 90% of the sample and in the second attempt in the rest, with a median flow rate of 19 mL/kg/h.[5] In patients that require administration of larger volumes, the use of recombinant human hyaluronidase could be considered, although it is somewhat controversial and the drug is not currently distributed in Spain.[6]

Based on the potential advantages of this route, it may be worth contemplating its use in other diseases and in other settings, such as the emergency room, inpatient wards or the home. In addition to its use in palliative care for the usual treatment goals, subcutaneous access could be useful when insertion of an intravenous catheter is not possible, due to difficult access, for delivery of treatment such as procedural sedation and analgesia, fluids in patients with dehydration in absence of shock and electrolyte imbalance or nutrition in patients with poor oral intake.

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