

Administration of lipid emulsions to adult intensive care patients: impact on the blood lipid profile

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Background

- Lipid emulsions (LE) are widely used in ICU patients, either in **artificial nutrition** or as **vehicle** for sedation (propofol 1% or 2% only available in a 10% LE).
- Hypertriglyceridemia (HTG) is a **possible side effect** of LE, but its real risk has not been evaluated yet in ICU patients.
- Guidelines¹ recommend to **monitor** plasma triglyceride concentrations (PTG) during treatment and to **decrease** the daily amount of lipid when high doses of propofol are used.
- Local guidelines recommend a maximum amount of lipid of **1 g/kg BW** over 24h.

Objectives

This study aimed at

- assessing the frequency of HTG in ICU patients
- identifying risk factors.

Main Outcomes :

- Occurrence of HTG > 2 mmol/l and > 3 mmol/l
- Correlation between PTG and administered lipids

Method

- Retrospective study of patients admitted to the 34-bed adult mixed medico-surgical ICU between February 29 and April 21, 2008.
- Data were extracted from the ICU computerised patient database (Metavison[®]).
- Inclusion criteria were
 - ICU stay > 48 h
 - at least 1 PTG measured.
- PTG were measured 3 times weekly (at 6 AM) and cholesterol level once weekly during the ICU stay

Method

- Analysis was based on the highest PTG during the stay.
- Descriptive and univariate analysis

Method

Main factors

- All doses of enteral and intravenous lipids during the 24h preceding PTG
- All doses of propofol during the 24h preceding PTG

Co-factors

- Age, sex
- BMI
- CRP
- Liver or renal failure
- Drugs received (pre-defined list)
- Main pathology (CNS, trauma, burns, cardio, pneumo, transplant, gastro, other)

Results

340 patients admitted to the ICU

130 patients fulfilled the inclusion criteria

Nr PTG measured	448	
Nr PTG \geq 2 mmol/l	146	32.6%
Nr PTG \geq 3 mmol/l	40	8.9%
Nr patients with at least one PTG \geq 2 mmol/l	40	30.8%
Nr patients with at least one PTG \geq 3 mmol/l	17	13.1%

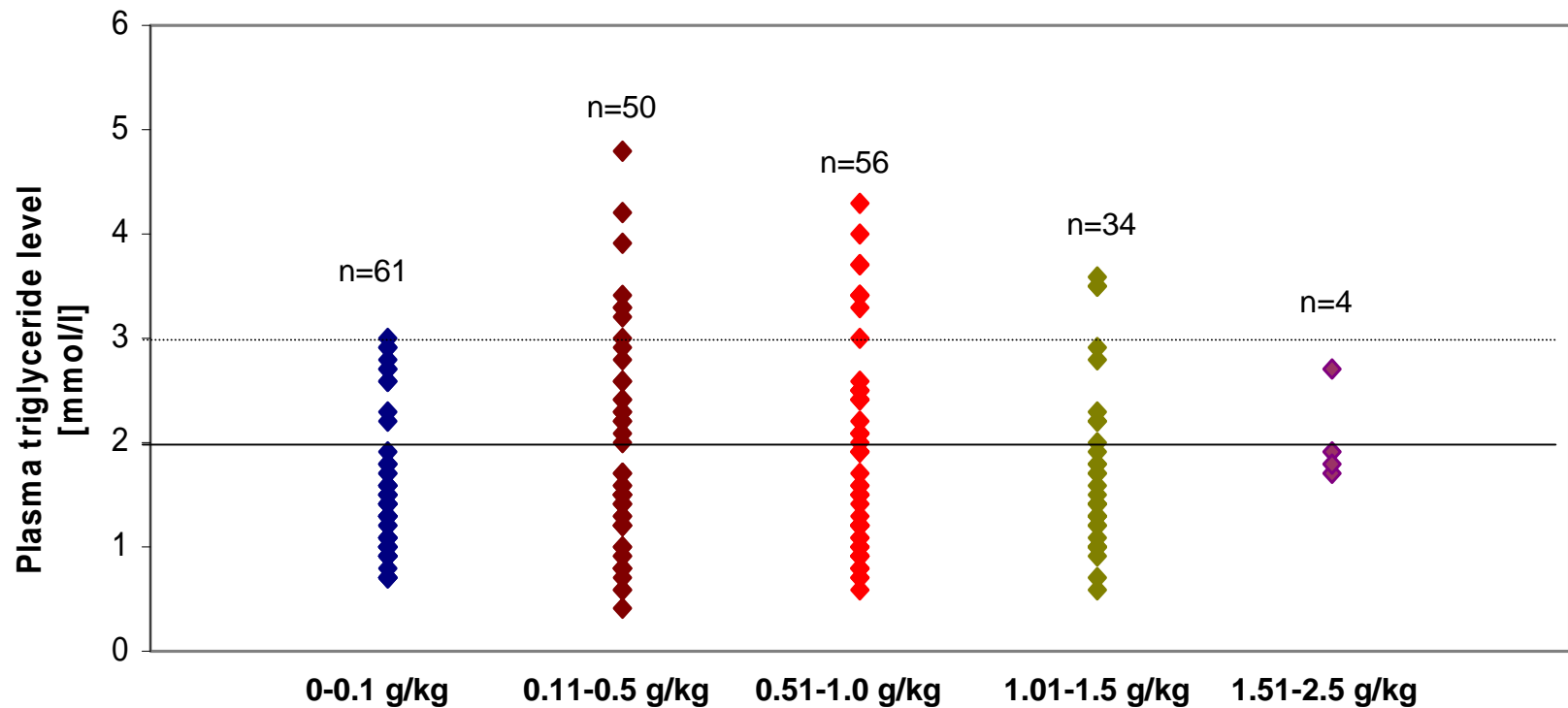
Results

**PTG were not correlated to any
of the defined factors.**

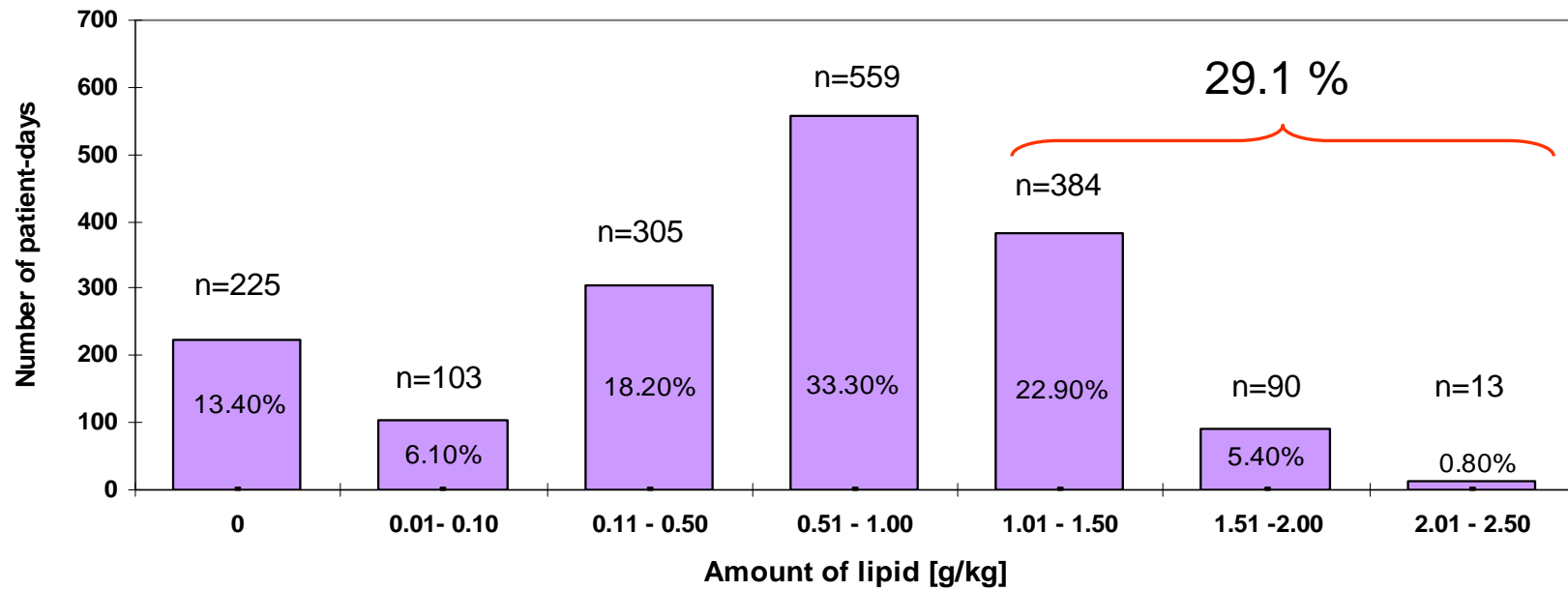
The response of PTG to lipid administration was highly variable between and within the patients.

Cholesterol was unaffected by the lipid dose.

PTG according to the amount of lipid received over the last 24h



Amount of lipid administered per patient-days



Pierre Voirol
 Lipides in ICU patients - ESCP - Oct 23, 2008

Limitation

Baseline PTG at hospital admission was not available

→ Impossible to know if patients had already high PTG before hospitalization.

Conclusions

- HTG is frequently observed in ICU patients (30% vs. 20% in the community).
- However, no risk factor could be identified probably because of the large number of pathophysiological and pharmaceutical parameters, which influence PTG in ICU patients.
- Daily doses of lipid exceeded local guideline in 29% patient-days.
- A larger study should be conducted to confirm the present results and determine the impact of lipid administration in ICU patients.