Società Italiana delle Scienze Veterinarie

Dipartimento Medicina Veterinaria Produzioni Animali

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

CARDIOVASCULAR CHANGES, LABORATORY FINDINGS AND PAIN SCORES IN CALVES UNDERGOING ULTRASONOGRAPHY-GUIDED BILATERAL RECTUS SHEATH BLOCK FOR UMBILICAL HERNIA REPAIR: A PROSPECTIVE RANDOMIZED CLINICAL TRIAL

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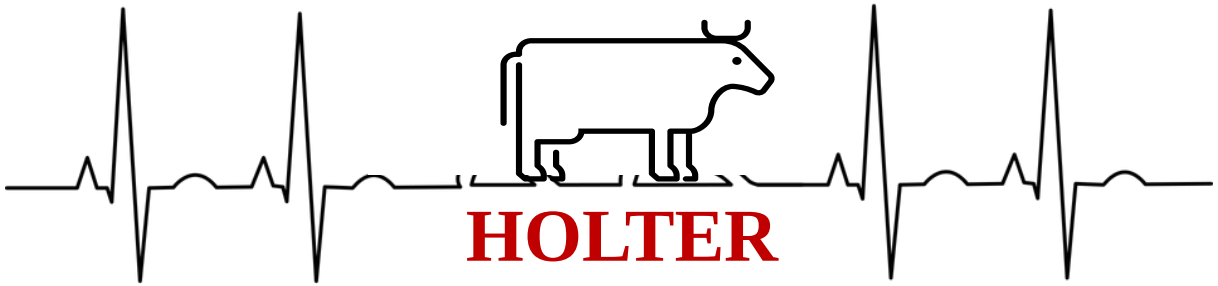
INTRODUCTION

Animal Welfare

Free
❖ PAIN
❖DISCONFORT
❖STRESS

How to monitor it….?



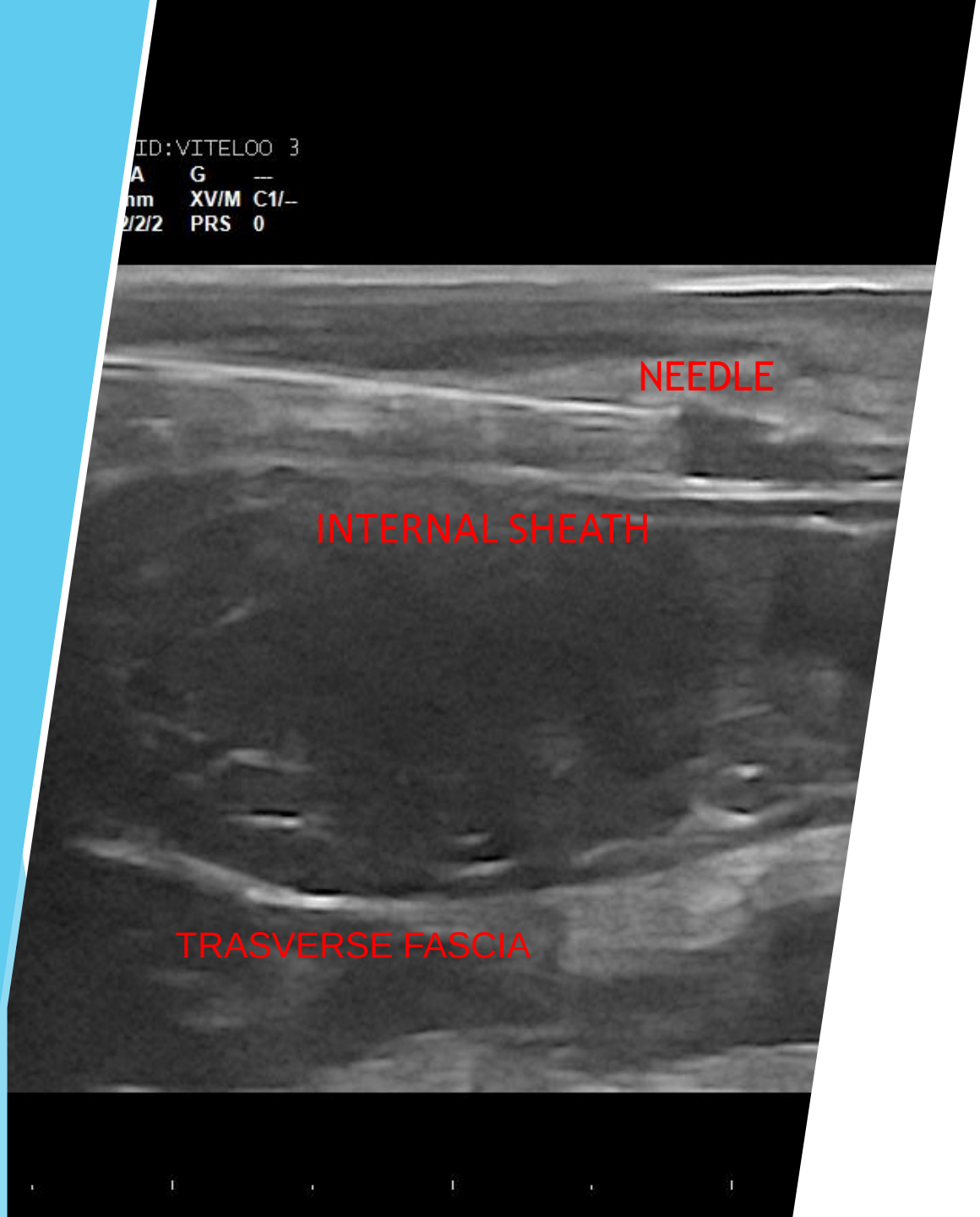
HOLTER

SERUM CORTISOL LEVEL

PAIN SCALE

▶TARGET:

Ultrasound-guided rectus sheath block (RSB) effects on health and welfare of calves affected by uncomplicated umbilical hernia undergoing herniorrhaphy.



What is the RSB ?

- *Block of the rectus abdominal muscle sheath involves the ultrasound-guided injection of a local anesthetic into the space between the internal aponeurotic sheath of the muscle and the underlying transverse fascia, to block the ventral branches of the spinal nerves from T10 to T12 responsible for innervation of the umbilical district*

- Hypothesis:

The study's hypothesis was that a multiparametric approach could better discriminate between animals receiving and not- receiving an ultrasound-guided rectus sheath block (RSB) as an analgesic strategy for herniorrhaphy, quantifying pain, stress, and discomfort.

MATERIALS AND METHODS

Enrolled…. *14 CALVES*

eligibility criteria :

- *being classified as healthy according to the historical data (i.e., no other health problems from the calving to the surgery time)*
- *being characterized by a good health status at enrollment*
- *reducible umbilical hernia*

- **Complete clinical examination**
- **Haemato-biochemical investigations**
- **Ultrasound examination**

14 calves

Anesthesia:

xylazine + butorphanol

ketamin

RSB group- TG

0.3 mL/kg of bupivacaine 0.25%

0.15 µg/kg of dexmedetomidine

Control group- CG

Placebo solution

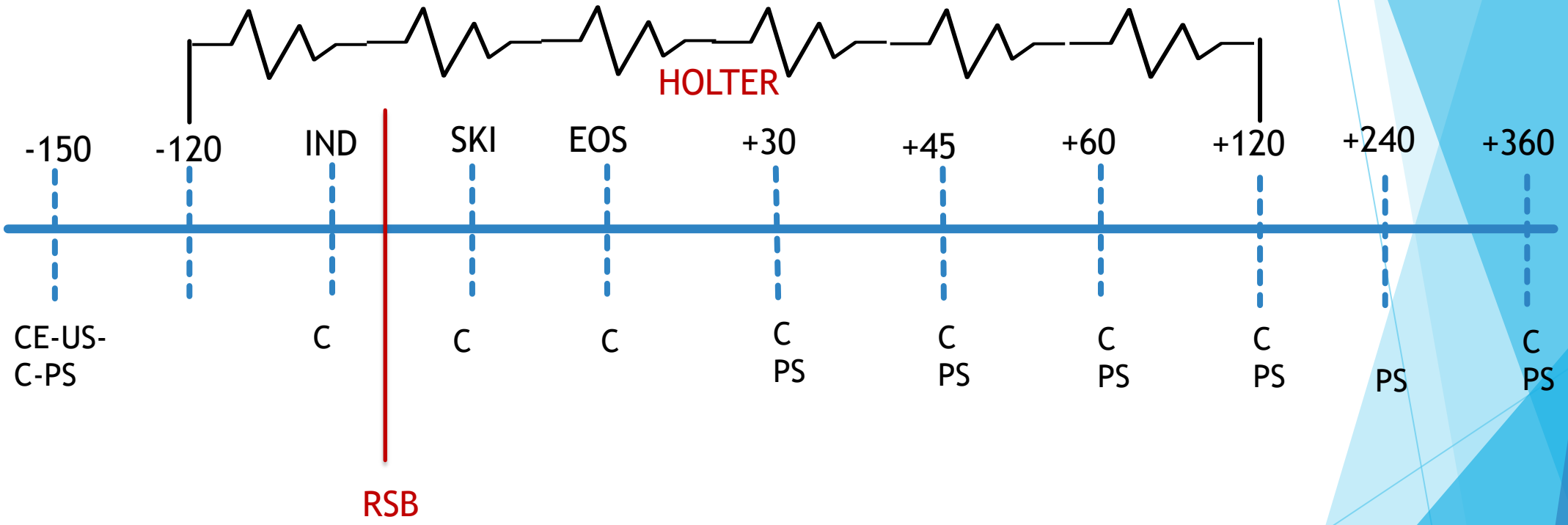
0.3 mL/kg of 0.9% NaCl

RECEIVE EITHER SAME PROCEDURE AND THE HERNIORRHAPHY

MULTIPARAMETRIC APPROACH

TIME LINE

RECTUS SHEATH BLOCK FOR UMBILICAL HERNIA REPAIR



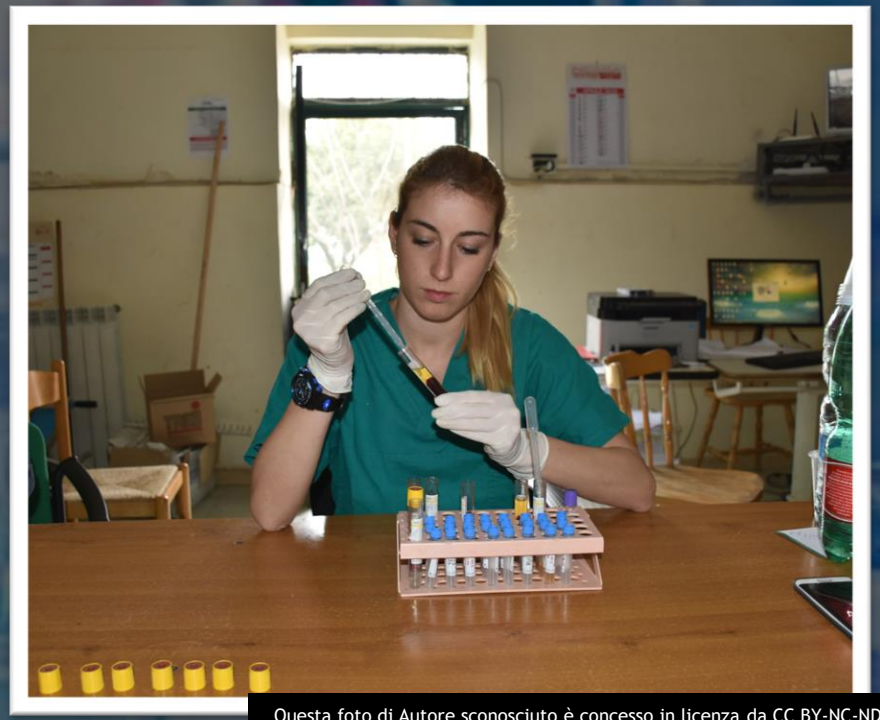
CE: clinical examination
US: ultrasonography
PS: Pain scale
C: cortisol basal

HOLTER

I DER: BI-5 S.I. DX R-5 S.I. SX
II DER: BL-5 S.I. DX AR- 4 S.I. SX
III DER: N-7 S.I. DX MAR- 1 S.I. SX
TERRA SX

BLOOD SAMPLING

- Trichotomy and surgical scrub of the jugular region were performed
- A jugular blood sample was withdrawn to assess serum cortisol
- they were placed into serum tubes
- centrifuged to obtain the sera
- Transported to the laboratory



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UNESP-Botucatu
Pain scale

3 OPERETORS FOR 20 MINUTS
+5 MINUTS

1. locomotion
2. interactive behavior
3. activity
4. appetite
5. miscellaneous behaviors

0 (normal) - 2 (totally abnormal)

STATISTICAL ANALYSIS

Data were expressed as absolute numbers, percentages, range or mean,+_ SD

Variables were analyzed by test for Normality

Data originating from **Holter monitoring** divided in 8 time-intervals:

- Int-1 = -120min pre-surgery to +120min post-surgery
- Int-2 = -120min pre-surgery to beginning of IND-t
- Int-3 = beginning of IND-t to Eos-t
- Int-4 = EOS-t to +120min post-surgery
- Int-5 = EOS-t to +15min
- Int-6 = EOS-t to +30min
- Int-7 = EOS-t to +60min
- Int-8 = EOS-t to +120min

- Multiple **intra-group** comparisons for the same parameters by one-way repeated measures **ANOVA** applying a Bonferroni correction P=0,006.
- **Inter-group** comparison at the different times intervals for **HR** and **SCL** values were performed by the independent Two-Tailed **Students' t-test.**
- **int-2, int-3 and int-4** for cardiac arrhythmia were assessed using using χ^2**-test**
- **pain scores** between calves receiving RSB and CG were compared using **Mann–Whitney U test**

P< 0,05

RESULTS DISCUSSION

- **Holter monitoring**

240min of Holter recording

HEART RATE

EFFICACY BLOCK

(*P*=0.005).

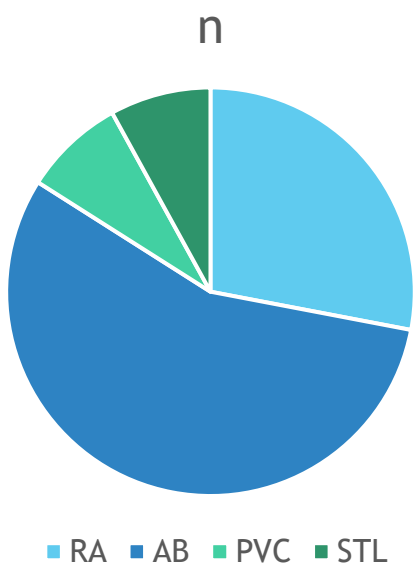
no statistically significant differences were observed **INTER-groups** at any time.

- A statistically significant **intra-group** difference was instead observed for **the RSB** group between **int-2** (i.e., -120min pre-surgery to the beginning of IND-t) **and-3** (i.e., beginning of IND-t to EOS-t) (*P*<0.005).

CARDIAC DYSRHYTHMIAS

13/14 showed at least one episode during the recording periods

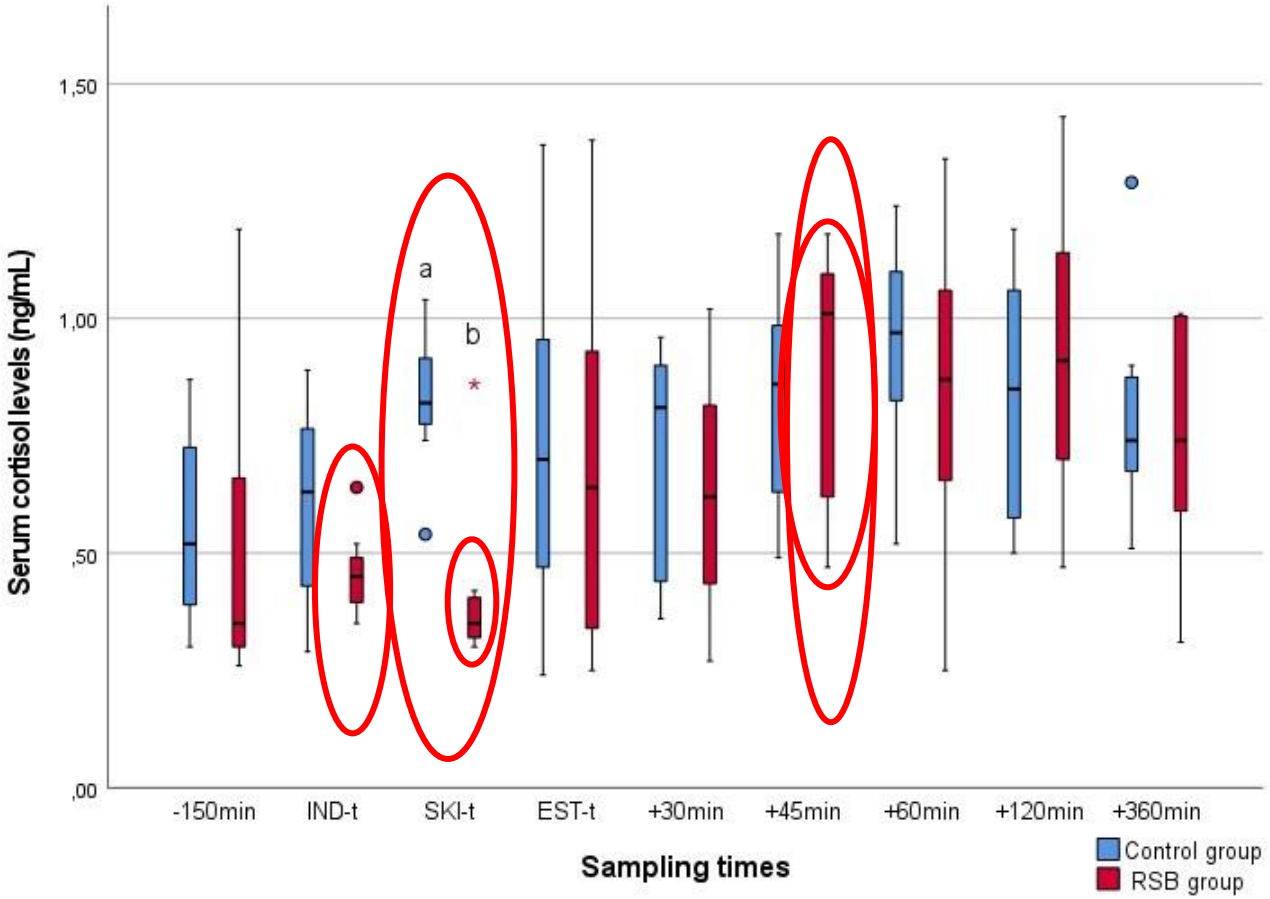
INT-2				
	RA	AB	PVC	STL
CG	3	3		1
RCB	2	4	1	
INT-3				
CG		2		
RCB		1		
INT-4				
CG	1	1	1	1
RCB	1	3		



Action of the α-2 adrenergic agonist on the central and autonomic nervous systems

RA: respiratory arrhythmia
AB:atrioventricular blocks II degree
PVC:premature ventricular contractions
STL: sinus tachycardia lasting

Serum cortisol analysis



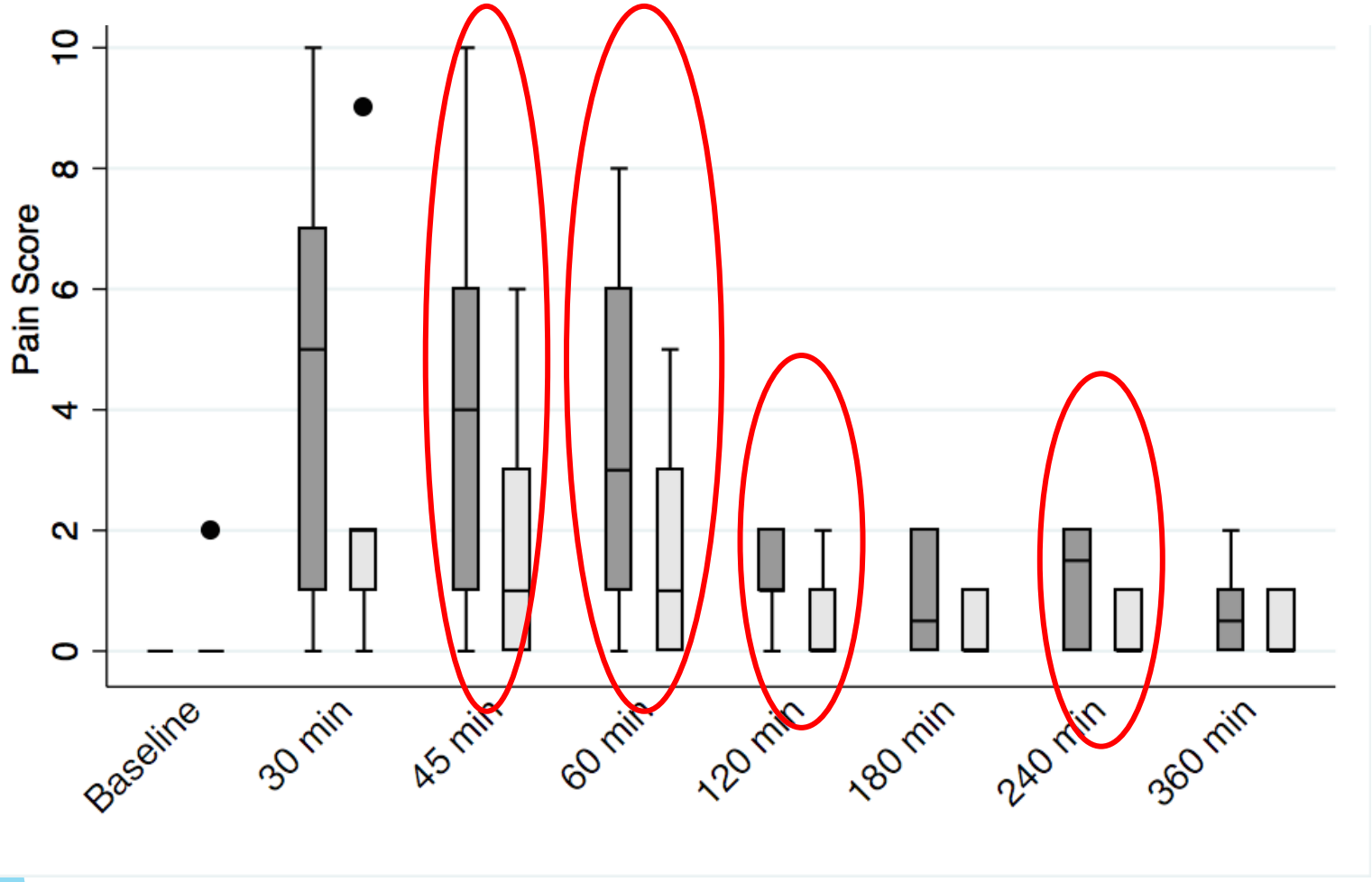
- a significant difference was observed **INTER GROUPS** between RSB group and CG at **SKI-t** (*P*=0.003)

- an **intra-group d**ifference was found within the **RSB** group between **IND-t and +45min** (*P*=0.004) as well as between **SKI-t and +45min** (*P*=0.005).

- Unusual situation
- Actions carried out
- Investigators' presence

Unidimensional pain scale

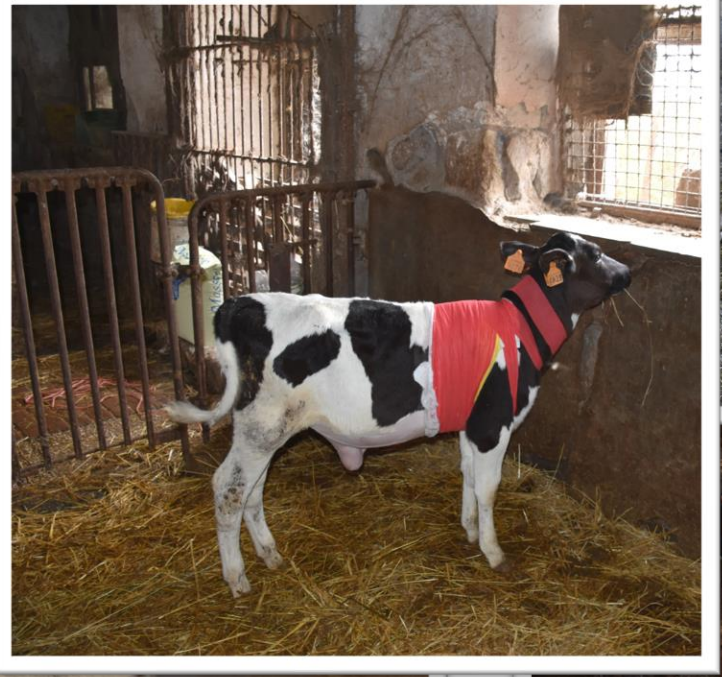
Calves receiving RSB recorded lower pain scores between **45 60 120 minutes** after recovery and at +**240 min** after recovery ($P < 0.05$).



Long-term analgesic effects
Bupivacaina 6-8h

Take home message

- The Holter monitoring and SCL revealed greater reliability during surgical procedures when the patient was unconscious, and there were no forms of interactions with him.
- Pain scale reliable instrument to assess post-surgical pain

Confirm the hypothesis of beneficial effects on health and welfare during *Ultrasound-guided rectus sheath block (RSB) in calves affected by uncomplicated umbilical hernia undergoing herniorrhaphy.*

THANK YOU FOR YOUR ATTENTION !