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Supplementary Material

Post Procedural Pain Following Percutaneous Thermal Liver Tumor Ablation under Procedural Sedation and Analgesia: A Single Center Retrospective Cohort Study

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ABSTRACT

Background and Objectives: The incidence of post-procedural pain following percutaneous thermal liver ablation under procedural sedation and analgesia (PSA) is yet largely unknown. Only a few small studies investigated tumor and ablation factors on pain, whereas psychological or PSA factors as possible predictors for pain were not investigated. The primary aim of the current study is to measure the prevalence and severity of post-procedural pain based on maximal NRS. Secondary aim of this study is to identify predictors for post procedural pain post liver ablation under PSA.

Methods: This single center retrospective cohort study was conducted in a tertiary teaching hospital in the Netherlands from November 2018 until May 2023. It involved adult patients (18 years or older) treated with thermal liver ablation under PSA. Prevalence of pain was based on percentage of patients with post-procedural pain (defined as numeric rating scale (NRS) score ≥4).

Results: In total, 170 records of 117 patients were included in the analysis of this study. The prevalence of post- procedural pain after thermal liver ablation was 42.7%. Predictors of post-ablation pain were psychological factors e.g. depression, anxiety disorder or the use of psychopharmacological drugs (β 2.58, 95%CI: 1.44-4.07, p-value<0,001). A background of chronic pain (β 1.23, 95%CI: 0.11-2.36, p-value 0.03), female gender (β 1.09, 95%CI: 0.17-2.01, p-value 0.02) and age (β -0.04 per calendar year, 95%CI: -0.091--0.006, p-value 0.05) were shown to predict acute ablation pain. Tumor location, distinction between primary and secondary tumors and number of tumors did not predict post-ablation pain.

Conclusion: The incidence of post-procedural pain after thermal liver ablation is 42.7%. Predictive factors of post procedural pain after thermal liver ablation under PSA are psychological factors like depression and anxiety as well as the use of psychopharmacological drugs. Tumor characteristics did not predict post-procedural pain after ablation.

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Table 1: Distribution per NRS score.

NRS	N	%	Cumulative %
0	37	21.8	21.8
1	25	14.7	36.5
2	27	15.9	52.4
3	9	5.3	57.6
4	17	10.0	67.6
5	19	11.2	78.8
6	12	7.1	85.9
7	13	7.6	93.5
8	7	4.1	97.6
9	2	1.2	98.8
10	2	1.2	100.0
Total	170	100	

N: Frequency; %: Percentage

Table 2: Maximum NRS in univariable linear mixed-effects model.

	aβ	95% CI	P-value
BMI	0.03	-0.06-0.13	0.50
ASA	0.05	-0.67-0.77	0.90
Smoking	-0.26	-0.79-0.26	0.32
Alcohol	-0.32	-0.71-0.07	0.10
Drugs	-0.49	-1.50-0.52	0.34
Cirrhosis	0.06	-0.77-0.88	0.89
Chemotherapy*	-0.53	-1.38-0.32	0.22
Surgery*	0.15	-0.64-0.94	0.72
Thermal ablation*	0.04	-0.77-0.85	0.92
Duration anesthesia	0.00	-0.09-0.11	0.83
Duration procedure	0.00	-0.01-0.01	0.73
Maximum tumor diameter	0.02	-0.03-0.08	0.40
Tumor location	-0.40	-1.21-0.03	0.29
Vascular involvement	-0.03	-0.48-0.42	0.90
Number of lesions	0.21	-0.24-0.65	0.36
Esketamine**	-0.74	-1.53-0.04	0.06
Metamizol**	-0.46	-2.24-1.32	0.62

aβ: Regression coefficient adjusted for psychological factors, gender, chronic pain and age; CI: Confidence Interval; * < 1 year prior to treatment; ** administrated during PSA.