

ABSTRACT

7

8 Although there ~~are is~~ a considerable number of pain assessment scales, only some of them
9 ~~can~~ be used for practical intentions. The Faces Pain Scale is used for children 4 to 6-7 years
10 old, while the Visual Analog Scale (VAS) is used for children above this age.
11 A ~~7-months~~ study from December 1, 2011 to May 31, 2012, was used to assess the
12 acute pain levels among 177 children from birth to 13 years old in an Obstetrics and
Gynecology
13 Hospital, an University Hospital Centre, a Pediatric Hospital and an Outpatient Services in
Tirana^[E1].
14 For patients incapable to verbalize the pain intensity in a reliable way (neonates to the age of
four ~~< 4~~ years
15 old), ~~it is used~~ the hetero-evaluation was used. The hetero-evaluation is realized only with one
16 assessment scale, w. While patients older than 4 years and younger than ~~<~~ 6 years old were
assessed using the
17 ~~hetero~~ hetero-evaluation and auto-evaluation scale according to the Faces Scale and VAS.
18 The auto-evaluation of the acute pain intensity is applied according to two different
19 assessment scales during, ~~consisting in~~ the same procedure, on the same patients. The
assessment
20 according to VAS is applied in two positions, horizontally and vertically. The results obtained
21 from the different scales and the VAS positions are compared, ~~between one another~~. The
22 NFCS and the Faces Scale are much more easily accessible by the nursing staff; while the
multidimensional scales (OPS, CRIES, PIPP) were found more difficult to be used.

INTRODUCTION

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31 The medical science is becoming more and more sophisticated, but unfortunately ~~this~~ is
32 not always the case in ~~more to do with the~~ pain management. Adults are the first persons that
benefited from the
33 recent researches in this direction, mainly in the last two decades; meanwhile “uncommonly”,
the pain is still untreated or insufficiently ~~untreated~~ among the children.^{[5][13][38][E2]} 34
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36 Physical pain is not just a transmission of electrical impulses in the corresponding sectors; it's
considered as a “conflict” between the stimulant and the person that is suffering.^{[1][3][44]} 37
38 Unrelieved pain may cause anxiety and stress, or in other cases even psychological and
behavioral long term damage ~~consequences~~.^[26] 39
40
41 Pain is an important part of the disease, ~~it's~~ it's the first evident symptom. ^{[4][41]} 41 Recently it is not
42 considered anymore by the researchers and the doctors as a symptom, but as a specific
43 disease, defined as “The Fifth Vital Sign”. Synchronal with this conception, there are other
44 new notions like nervous system hypersensitivity caused by the acute pain and the
45 rehabilitation, known for their important role due to major developments in the multimodal
46 analgesia.
47
48 Last years the researches are mostly focused on pain assessments as the main element that
precedes the treatment. ^[48] 49 They ~~are~~ is used a specific number of assessments scales to measure
50 ~~the~~ pain, mainly ~~for the~~ acute pain; but none of them fulfill at the same time all the criteria of
validity

reliability and applicability. Anyways, we can say that there ~~were~~^{are} adopted some assessment scales for the use in ~~according the~~ researches or for daily use only.

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Pain assessment is an essential element for adequate ~~the~~ treatment. The success of a good analgesic

management is based firstly on the valuation of the pain according to the used scales. [27][48] 55

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Schematically, we can say that we used the behavioral scale like NFCS or CHEOPS or multidimensional scales (that combine the physiological markers like Pam or SpO₂ with the behavioral variations) like OPS, PIPP, CRIES, etc. to diagnose the children.[19][21] 59

60

Pain assessment is based in two groups of measurement: the measurement of physiological parameters [26] and the measurement of behavioral factors. [11] [18] 62 The physiological factors (like tachycardia, tachypnea, sweating, and the increase of arterial pressure) are always part of the pain, but they are not specific. Therefore, the behavioral scales are the main modalities used to assess the pain in neonates, infants and children under 4 years old that are not capable of verbal communication.[12] 66 These scales are based on facial expressions (crying or grimace), motor response, the vision and verbal response; for example the FLACC scale.

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Although there is a considerable number of pain assessment scales, only some of them could be used for practical intention. We can use the FLACC scale for abovementioned age-group. The Faces Pain Scale is used for children 4 to 6-7 years old, while the Visual Analog Scale (VAS) is used for children above this age.[14][17][46] 72

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74 MATERIALS AND METHODS

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A 7-months[E3] study from December 1, 2011 to May 31, 2012, was used to assess the acute pain

among 177 children from birth to 13 years old in Obstetrics and Gynecology Hospital, University Hospital Centre, Pediatric Hospital and Outpatient Services in Tirana[E4].

For patients, incapable to verbalize the pain intensity in a reliable way (neonates to <4years old), ~~we it is~~ used the hetero-evaluation. The hetero-evaluation is realized only with one assessment scale.

While patients above $\geq$ 4 years old and younger than $<$ 6 years old are assessed using the ~~heteroreto~~-evaluation and

auto-evaluation scale according to the Faces Scale and VAS.

The auto-evaluation of the acute pain intensity is applied according to two different assessment scales, consisting[E5] in the same procedure, on the same patients. The assessment according to VAS is applied in two positions, horizontally and vertically. The results obtained from the different scales and the VAS positions are compared between one another.

The auto-evaluation scales are combined as below:

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90 VAS/ NRS

91 VAS/ Faces Scale

92 Pain is divided in 4 different levels, for all the scales:

Results should be added above Graphs

106 The assessment is applied among 177 patients, 40.1% of them females and 59.9% males[E6].

DISCUSSION

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139 According to the study's results, the percentage of postoperative patients with intense pain is
140 47.62% and with maximum pain is 52.38%. There are 5.77% non-postoperative patients
141 with

142 moderate pain, 55.77% with intense pain and 38.46% with maximum pain. In conclusion,
143 all postoperative patients and 94.23% of non-postoperative children undergoing painful
144 procedures experienced intense and maximum pain. [16][37][43]

144

145 The average of the obtained results using all the scales varies in that way to show intense or
146 maximum pain levels, as well.

147

148 Most of the researchers claim that if we compare the pain levels between males and females,
149 the first ones are lower, but it is not considered as statistically significant ($p > 0.05$ for all the
150 scales). However, we should take in consideration the fact that the auto-evaluation is applied
151 among a small sample (24 patients-13.56%). [15]

152

153 The previous studies indicate different levels of scoring, using the visual analog scale (VAS)
154 in two different orientations-horizontal and vertical. Researchers argue that there are
155 inequalities because of the difficulties among the children's spatial orientation, from 0-10
156 years old. [20]

157

158 The NFCS and the Faces Scale are much more easily accessible by the nursing staff; while
159 the
160 multidimensional scales (OPS, CRIES, PIPP) were found more difficult to be used. [17][47] This
161 because of:

162 1. The considerable number of parameters to be assessed and saved in epidemiological
163 files.

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2. In many cases, there is not the required information about the levels of AP before and
164 after the procedure.

165 3. Since there are fixed requirements for the reference values (the values of parameters
166 before the

167 surgical intervention or before the painful procedure), these could not be always
168 documented. [34]

169 The presence of parents during the auto-evaluation has played an important role in children's
170 maximal collaboration, increasing in this way the obtained data validity. [9][33][45]

170

171 TREATMENT

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173 Pain treatment consists in providing a maximum pain relief and a minimum of side

174 effects. [10][35][42] The multimodal analgesia is considered to be as the most suitable method,

175 based on the synergistic effects of different analgesics, decreasing the necessity of using high
176 doses and lowering the incidence of adverse effects of them. [2][7][21]

177

178 Analgesics

179 ~~For treatment of mild and moderate pain, could be used~~ medicaments as paracetamol, NSAIDs

180 (ibuprofen, naproxen, ketoprofen) and mild opioids (codeine, tramadol, dextropropoxyphene) ~~could be used.~~

181 ~~For average pain intensity, could be used~~ opioids, accompanied with NSAIDs.

182 ~~In intense pain we, there are~~ recommended major opioids (morphine, fentanyl, hydrocodone, oxycodone). NSAIDs could be used to increase the opioid's effects. [23][28][32] 183

184 Local anesthetics could be used as peridural and intrathecal administration.

There are two types of analgesics: minor and major, or opioids and non opioids. [30] 185

186 Acetaminophen (Paracetamol) is a minor analgesic that increases the effects of

187 analgesia when it is used with another major analgesic. It is the most widely used analgesic

188 among children for oral and rectal use. The optimal dose of acetaminophen it is not exactly

189 defined, but usually it is used 10-15mg/kg, oral use. High doses of acetaminophen used in

190 children with serious infections are considered as an indication for hepatic insufficiency.

Therefore, it is suggested to be used for short period of times [36] 191 .

192 Ibuprofen is a non steroid anti inflammatory drug used mainly to treat the pain and

temperature among children. [22] 193 It is suggested a 15mg/kg dose for oral use to have an

194 analgesic effect. However, for a repeated dose among 6 months to 12 years old children, it is

suggested a dose of 10 mg/kg, every 6h oral use (maximum daily dose-40 mg/kg). [36] 195

196 Naproxen has a longer half-life than ibuprofen, therefore it could be used every 8-12h.

197 ~~No specific It is not known any~~ information about the effect on infants is known. The usual or normal dose is

considered 5-10 mg/kg oral use, every 8-12 h (maximum daily dose-20 mg/kg). [22][36] 198

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200 Opioid analgesics are used by the nursing staff under strict supervision of a doctor, because of the serious side effects, such as inhibition of respiration. [29] 201

Opioids are used to treat pain among patients of different ages. [22] 202 If the dosage is correct, the

analgesic effects among children could be easily distinguished. [7][8] 203 There are different routes

204 of administration available for opioids, including oral, intravenous, rectal, transmucosal or

transdermal administration. [31] 205 *It is important to avoid the intramuscular or subcutaneous*

206 *route to pediatric patients*. Most of opioids are available in liquid forms and could be easily

207 applied to children with difficulties in managing the opioid pills. Recently, to manage

208 neoplastic pain treatment among children, it is used Fentanyl Transdermal Patch or other

209 forms of Fentanyl.

210

Sedatives are mostly used for their calming or sleep-inducing effect to reduce pain. [25] 211

212 The reasons why the pain could not be treated with opioids:

1. Side effects, such as respiratory 213 depression.

214 2. Dependence.

215 3. Insufficient information possessed by the staff about these drugs.

216 *Massage*

217 Skin stimulation relieves pain, as well. There are used different techniques such as pressure,

218 massage, vibration, heat and cold therapy, oily treatment which are considered to be very

219 effective and safe. The activation of A β big fibers and the inhibition of A δ and C small

fibers,

which close the pain "gate", can cause sedative effects. [7][8] 220

221 Friction massage applied to the painful region could relax the muscles and decrease the

222 tension. It is not recommended to the damaged skin since it could enlarge the damage. Skin

223 irritation could be treated with menthol products, which contain methyl salicylate that could

224 be absorbed, causing an analgesic effect in the affected area. Heat and cold therapy are use to

decrease muscular pain. [37][39][42] 225 The immediate change of temperature, from heating to cold

226 can cause analgesic effect that could last for hours. But, this is a method that can not be used
227 within the first 24 hours to a traumatized area. Cold therapy reduces blood circulation causing
228 positive effects, but preliminary we should take in consideration some advices about heat and
229 cold therapy:

230 ~~ΔοΤε~~ not use cold therapy to a hypo-vascular area

231 To avoid extreme temperatures that can cause burn or freezing injuries

232 ~~ΔοΤε~~ not apply heat therapy to a fresh wound because it might cause or increase bleeding

233 To stop the application if the pain is increasing

234 *Transcutaneous Electrical Nerve Stimulation (TENS)*

235 TENS by definition covers the complete range of transcutaneously applied currents, with low
236 voltage, transmitted to the affected area through some electrodes. It produces analgesics
237 effects through A β fibers stimulation and A δ fibers inhibition.

238 Skin irritation could be a side effect caused by the electrode stickers. This could be avoided
239 using hypoallergenic stickers, while redness could be avoided by cleaning the electrodes with
240 soapy water. Contraindications of TENS include the application in eyes, forehead, mouth,
241 neck. It is still not approved that TENS could perform safety during the very first months of
pregnancy, but it is used to lower back part after it.^{[7][8]} 242

243

244 *Biofeedback*

245 It is a method that trains patients to control certain bodily processes that normally happen
246 involuntarily, such as heart rate, respiratory rate and muscle tone. Relaxation decreases pain,
247 decreasing the anxiety as well, and increasing pain control.

248

249 Fear and death could accelerate pain levels. Sharing emotionally patient's experiences is as
important as the treatment. ^[24] 250

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253 **CONCLUSION**

254 Assessment is the first step toward the appropriate postoperative and procedural acute pain
255 management. The correct usage of assessment scales, according to a standard protocol
256 ensures to truthfully measure pain intensity, being the "key to success" for the necessary
257 information used to create the pain treatment modalities.