Received: 13 April 2021 | Accepted: 4 June 2021

DOI: 10.1111/ijcp.14511

ORIGINAL PAPER

Ear/Nose/Throat

THE INTERNATIONAL JOURNAL OF CLINICAL PRACTICE WILEY

Comparative evaluation of intravenous dexketoprofen and paracetamol in the management of pain induced by sore throat

Uzeyir Cimen[1] | Atakan Yilmaz[2] | Yesim Kinaci Cimen[3] | Murat Seyit[2] | Mert Ozen[2] | Bulent Erdur[2] | Ibrahim Turkcuer[2] | Gizem Oncel[1]

[1]Emergency Service, Servergazi State Hospital, Denizli, Turkey

[2]Faculty of Medicine, Department of Emergency Medicine, Pamukkale University, Denizli, Turkey

[3]Faculty of Medicine, Department of Family Medicine, Pamukkale University, Denizli, Turkey

Correspondence
Atakan Yilmaz, Department of Emergency Medicine, Pamukkale University Hospital, Pamukkale University of Medical Sciences, Denizli 20070, Turkey.
Email: dr_atakanyilmaz@yahoo.com

Abstract

Objectives: Sore throat is one of the most prevalent causes of emergency visits. The chief purpose of this clinical report is to investigate the effectiveness of intravenous (IV) dexketoprofen and paracetamol drugs relative to each other in relieving the pain induced by sore throat in emergency visits.

Methods: This prospective, randomised, double-blind, controlled study was conducted at a tertiary-level emergency unit. The eligible population (n = 200) with confirmed pharyngitis diagnosis on the Tonsillo Pharyngitis Assessment and moderate to severe sore throat was randomly divided into two cohorts to be administered with 50 mg of dexketoprofen (n = 98) or 1000-mg paracetamol (n = 102). The study drugs dissolved in 150-mL saline were administered by rapid IV infusion. All the recruited patients were re-assessed by Sore Throat Pain Intensity Scale (STPIS), Difficulty Swallowing Scale (DSS) and Swollen Throat Scale (SwoTS) at 15, 30, 45, 60, 90 and 120 minutes. In addition, presence of sore throat was re-evaluated by Sore Throat Relief Scale (STRS) at these time points.

Results: A total of 200 patients completed the study. The median age in dexketoprofen and paracetamol cohort was 25 (18-57) and 29 (17-76), respectively. Dexketoprofen and paracetamol provided relief in sore throat pain, with Total Pain Relief scores ($TOTPAR_{0-120\ min}$) being 5.68 ± 2.06 mm in the former case and 6.03 ± 1.76 mm in the latter ($P > .05$). The IV administration of paracetamol and dexketoprofen decreased STPIS, DSS and SwoTS scores over time, while increasing STRS scores. The average value of STRS was measured as 4.41 ± 1.18 in the paracetamol cohort and 4.15 ± 1.23 in the dexketoprofen cohort during 0-120 minutes ($P = .545$).

Conclusion: In emergency department, IV dexketoprofen and paracetamol reduced sore throat pain equally, providing similar analgesic efficacy.

1 | INTRODUCTION

One of the most common reasons for emergency department (ED) admissions is sore throat, which is a prevalent clinical manifestation disturbing patients, especially with upper respiratory tract infections (URTI). Some patients with URTI present to ED with moderate to severe sore throat pain.[1] In such a case, the primary goal of treatment in ED is to alleviate pain immediately and maximising patient comfort with minimum side effects.

Relieving sore throat pain in both acute and chronic periods is an indispensable aspect of treatment in URTI. As in other pain types, sore throat has also been treated over years with non-steroidal anti-inflammatory drugs (NSAIDs). Paracetamol and dexketoprofen are among the widely used analgesics administered to cure sore

throats. Dexketoprofen, a relatively new drug, has become a sought-after NSAID in the management of pain induced by sore throat.[2] Paracetamol, a first-line analgesic used in pain management for many years, proves to be effective in relieving sore throat.[3]

There have been some attempts to develop disease-specific scales to evaluate specific features of sore throat in URTI.[3-6] These scales have enabled to evaluate which NSAIDs exert a better analgesic effect in URTI-related throat pain and to standardise the evaluations. Furthermore, recent revisions of these scales have allowed for better categorisation of sore throat pain.[5]

Within this framework, the major aim of this clinical report is to offer a comparative evaluation of intravenous (IV) dexketoprofen and paracetamol in the management of pain induced by sore throat in emergency visits.

What's known

- Paracetamol is widely used in palliation of sore throat.
- Dexketoprofen has been widely used as a newly developed analgesic for palliation of muscle and joint pain and postoperative pain.

What's new

- It has been shown that dexketoprofen is a suitable analgesic for pain palliation in sore throat.
- It has been shown that dexketoprofen is as effective as paracetamol in sore throat palliation.

2 | METHODS

2.1 | Study type

This equivalence study was performed in Pamukkale University Medical Faculty (PAUTF) ED during an 8-month period, specifically between 1 December 2017 and 30 July 2018. We received the ethics approval from Pamukkale University Clinical Research Ethics Committee (dated 14.11.2017 and numbered 60116787-20/77529) and followed the protocols laid down in the Helsinki Declaration throughout the conduct of this study. Our study was funded by Scientific Research Project Unit of Pamukkale University (ref. no 2018TPF012) and approved by American clinical trials (ref. no NCT03768882).

2.2 | Study population

The study population was made up of patients who presented to ED of Pamukkale University, Denizli, Turkey with complaints of acute throat pain during an 8-month period, specifically between 1 December 2017 and 30 July 2018. A total of 15 604 patients were evaluated; 15 400 patients were excluded due to various reasons. Two hundred four patients who were eligible after these exclusion criteria were included in the study. In addition, the patients who matched the pre-specified inclusion criteria and provided their informed consent were recruited for this clinical trial (Figure 1).

2.3 | Subject selection

The patients over 18 afflicted with throat pain for less than three days were admitted to the study. The patients were recruited in accordance with the inclusion criteria, such as exhibiting at least two symptoms in the URTI Questionnaire, having a score of 5 and above in Tonsillo–Pharyngitis Assessment (TPA), being above 60 mm in Sore Throat Pain Intensity Scale (STPIS), being above 50 mm in Difficulty Swallowing Scale (DSS), and being above 33 mm in Swollen throat Scale (SwoTS) (3). Those who did not give their informed consent and meet the inclusion criteria were excluded from the study (Figure 1).

URTI questionnaire, TPA, STPIS (visual analog scale), DSS (visual analog scale) and SwoTS (visual analog scale) were utilised in order to assess sore throat pain. The patients were evaluated with seven parameters in accordance with TPA used during physical examination (Table 1). These parameters included oral temperature, oropharyngeal colour, size of tonsils, number of oropharyngeal enanthems (vesicles, petechiae or exudates), the size of the largest anterior cervical lymph nodes, the number of anterior cervical lymph nodes and maximum tenderness of some anterior cervical lymph nodes.[3] The subjects were assessed with a scale of 100 mm in STPIS, DSS and SwoTS.[5] They were also evaluated in terms of URTI questionnaire in their first presentation. The parameters in URTI questionnaire consist of six parameters, including nasal congestion-sneezing and runny nose, conjunctival hyperaemia and tear, cough and sputum, headache and muscle pain, fever, and sore throat.[3]

The exclusion criteria identified before the initiation of the study can be listed as follows: refusing to participate, being illiterate, being uninformed about the study due to congestion in ED, using any lozenge or throat spray in the last 4 hours, taking any antipyretic drug in the last 12 hours, using any antibiotic drug in the last 24 hours, using any quinolone group antibiotic drug in the last 1 week, having comorbid diseases (cerebrovascular disease, coronary artery disease, diabetes mellitus, hypertension), being allergic to non-steroid drugs, breast-feeding and having defined or possible pregnancy and undergoing kidney or liver transplantation (Figure 1).

2.4 | Research protocol

A simple randomisation was performed using Statistical Package for Social Sciences v.22 (IBM Corp., SPSS Inc, Chicago IL, USA). After

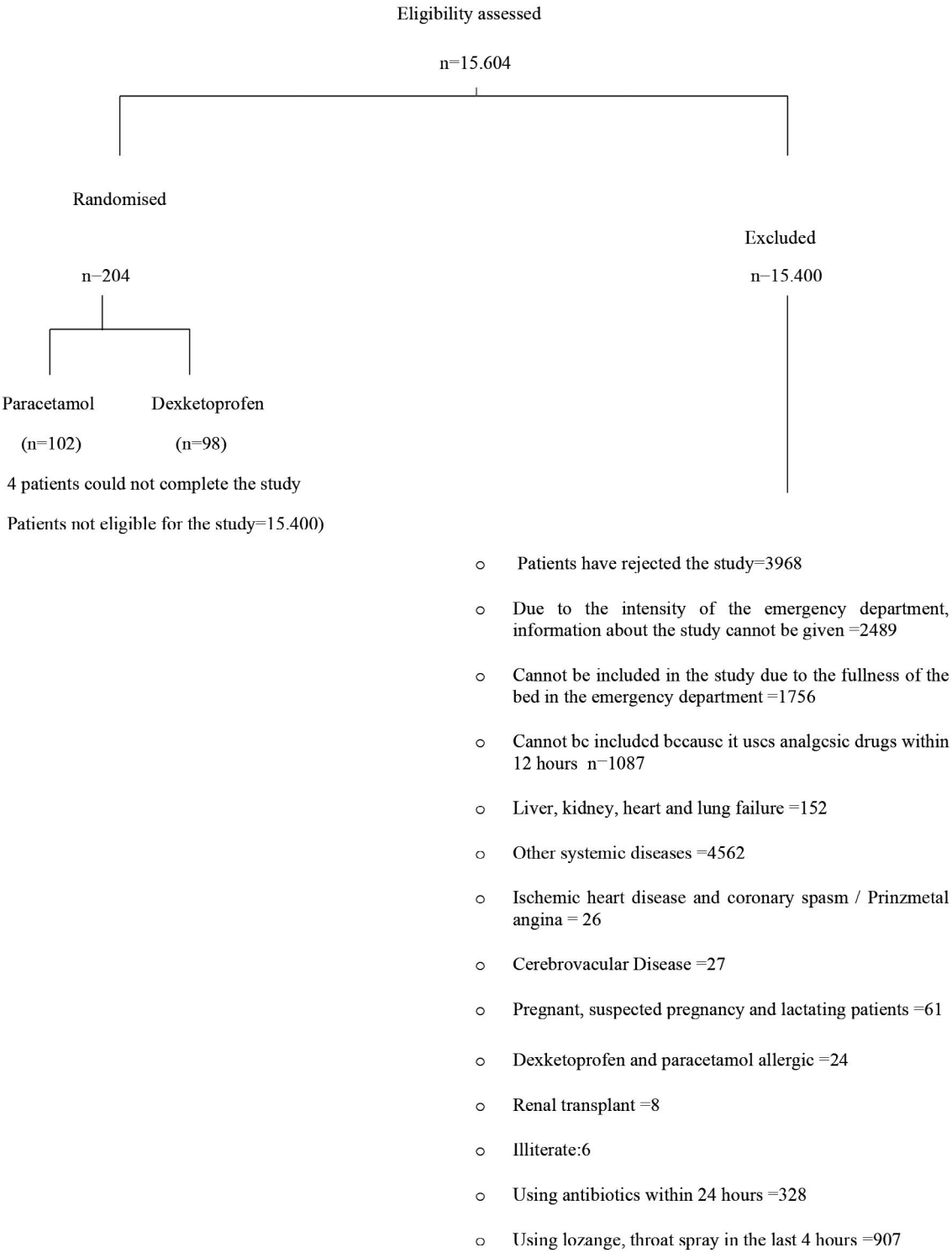

FIGURE 1 Flow diagram of eligible patients for study

an independent allocator prepared a computer-generated randomisation schedule, the eligible subjects were assigned serial numbers concealed in a sealed envelope.

In this clinical trial, there were two cohorts administered with two different drugs in varying doses. One cohort was given paracetamol (1000 mg) (Perfalgan, Bristol – Myers Squibb, USA; 1 g in 150-mL normal saline), whereas the other was administered with dexketoprofen (50 mg) (Arveles, IE Ulagay-Menarini, Turkey; 50 mg in 150-mL normal saline).

All the recruited patients were monitored in ED for 2 hours. Peak analgesic effect of paracetamol and dexketoprofen begins at 60 and 45 minutes respectively, as written in their drug prospectus. Therefore, 2-h period of observation seemed enough for a comparative evaluation of their analgesic effects. IV administration of the

TABLE 1 Tonsillo–Pharyngitis Assessment (TPA)

	0 Points	1 Point	2 Point	3 Point	Points received
Finding					
Oral temperature	≤37°C	37.0°–37.2°C	37.2°–37.7°C	≥37.7°C	
Oropharyngeal colour	Normal/pink	Slightly red	Red	Beefy red	
Size of tonsils	Normal/absent	Slightly enlarged	Moderately enlarged	Much enlarged	
Number of oropharyngeal enanthems (vesicles, petechiae or exudates)	None	Few	Several	Many	
Largest size of anterior cervical lymph nodes	Normal/absent	Slightly enlarged	Moderately enlarged	Much enlarged	
Number of anterior cervical lymph nodes	Normal	Slightly increased	Moderately increased	Greatly increased	
Maximum tenderness of some anterior cervical lymph nodes	Not tender	Slightly tender	Moderately tender	Very tender	
Total score					

TABLE 2 Baseline characteristics

Variable	Dexketoprofen	Paracetamol	*P*
Gender, n (%)			.094*
Male	44 (56.4)	34 (43.6)	
Female	54 (44.3)	68 (55.7)	
Age (year)			.131**
Mean ± SD	25.46 ± 8.28	28.88 ± 12.73	
Mean TPA ± SD	7.91 ± 3.98	8.20 ± 4.41	.672**
Mean URTI questionnare ± SD	4.01 ± 1.13	4.15 ± 1.23	.290**
Mean STPIS score ± SD	50.31 ± 14.17	50.84 ± 14.04	.793***
Mean DSS score ± SD	41.49 ± 18.17	41.24 ± 22.17	.931***
Mean SwoTS score ± SD	43.19 ± 19.39	40.16 ± 21.77	.084**

Abbreviations: DSS, difficulty swallowing scale; SD, standard deviation; STPIS, sore throat pain ıntensity scale; SwoTS, swollen throat scale; TPA, Tonsillo–Pharyngitis assessment; URTI questionnare, upper respiratory tract infection questionnare.

**P* value derived from Pearson chi-square test.

***P* value derived from Mann–Whitney test.

****P* value derived from independent sample T test (Levene).

study drugs was preferred rather than their oral or intramuscular counterparts due to providing rapid onset of pain relief and improving patient comfort at a faster pace.

During the procedure, SpO_2, blood pressure, rate and rhythm monitoring were screened, and other drugs, if any, given in the course of the study, were also noted. Body temperature on admission was measured under the armpit with Nimo® HNK-ECT-1 device, while oxygen saturation and blood pressure were screened on Nihon Kohden® BSM-2301K bedside monitor. All the enrolled patients were re-evaluated with STPIS, DSS and SwoTS scales at 15, 30, 45, 60, 90 and 120 minutes. In addition, the degree of relief in sore throat pain was measured by STRS at these time points. STRS is a scale system that gauges the amount of relief occurring over time after the administration of a medication. STRS, which is a 7-category ordinal scale (0 = *no relief*, 1 = *slight relief*, 2 = *mild relief*, 3 = *moderate relief*, 4 = *considerable relief*, 5 = *almost complete relief* and 6 = *complete relief*), allows for quantitative assessment and comparison between groups.[6] Total Pain Relief over 120 minutes following the first drug intake ($TOTPAR_{0-120\ min}$) was identified as the area under the plot of pain relief scores over this time range. In other words, the aggregate STRS scores in this time range was multiplied by the time range between consecutive ratings.[7]

$$\begin{aligned} TOTPAR_{0-120\,min} &= (0.25\times STRS_{15\,min}) + (0.25\times STRS_{30\,min}) \\ &+ (0.25\times STRS_{45\,min}) + (0.25\times STRS_{60\,min}) \\ &+ (0.5\times STRS_{90\,min}) + (0.5\times STRS_{120\,min}). \end{aligned}$$

2.5 | Data analysis

The collected data were analysed using Statistical Package for Social Sciences v.22 (BM Corp., SPSS Inc, Chicago IL, USA). A power calculation was performed before the initiation of the study so that the difference between the compared cohorts would have a substantial effect size (*dz* = 1.11). Assuming a statistical power of 95% with an alpha level of .05, it was calculated that 44 participants were required for each group. Accordingly, we assigned 98 participants to the dexketoprofen cohort and 102 participants to the paracetamol cohort. In relation to VAS findings, 100% power at 95% confidence

interval was obtained for paracetamol and dexketoprofen (both *dz* = 0.81 paracetamol *dz* = 0.94, dexketoprofen *dz*: 0.5).

Descriptive results were provided as mean and standard deviation, and continuous variables were expressed as mean ± standard deviation. The normality distribution of the data was checked using the Kolmogorov–Smirnov test. For parametric test assumptions, Independent Samples *t* Test was performed in comparing independent group means. Mann–Whitney U test and chi-square analysis were conducted if parametric assumptions were violated. A Friedman test was carried out to compare the groups in statistically repetitive measurements (STPIS, DSS and SwoTS), while a Pearson chi-square test was used in the comparison of their STRS scores. The association between the scores was revealed by a Spearman correlation test. A *P* value of < .05 was set as the limit for statistical significance.

3 | RESULTS

15 604 patients presented to our tertiary care ED with sore throat complaints between 1 December 2017 and 30 July 2018. After these presentations were assessed by the pre-specified inclusion and exclusion criteria, a total of 204 patients were divided into two cohorts, each of which was equally comprised of 102 patients. Four patients in the dexketoprofen cohort discontinued the study without completing the follow-up duration, and eventually the clinical data of 200 patients were examined (Figure 1).

Sventy-eight (39%) patients were male versus 122 (61%) female. One hundred two patients received paracetamol, and the remaining 98 patients were given dexketoprofen. No significant difference was identified in both cohorts in relation to gender and mean age as well as mean scores of TPA, URTI, STPIS, DSS and SwoTS ($P > .05$) (Table 2). Likewise, URTI symptoms yielded no significant difference between two cohorts ($P > .05$). STRS scores also did not change significantly between two groups at 0, 15, 30, 45, 60, 90 and 120 minutes ($P > .05$) (Figure 2). In addition, the mean $TOTPAR_{0-120\ min}$ scores in dexketoprofen and paracetamol group was 5.68 ± 2.06 mm and 6.03 ± 1.76 mm, respectively ($P > .05$). In the course of time, STPIS, DSS and SwoTS values were decreased by paracetamol and dexketoprofen, and their time-dependent changes were similar. However, STPIS, DSS and SwoTS scores differed significantly between the aforementioned time points in the dexketoprofen cohort ($P < .001$).

Another aspect of our analysis deserving attention is that STPIS, DSS and SwoTS scores of the subjects in the paracetamol cohort showed some significant differences between the minutes ($P < .001$). However, further post hoc analysis revealed no significant differences in these scores between 0-15 and 90-120 minutes in both cohorts ($P > .05$) (Table 3) (Figure 3A–C).

When STPIS, DSS and SwoTS and $TOTPAR_{0-120\ min}$ scores were compared by Spearman correlation analysis, a significant weak positive correlation was established between STPIS and DSS ($P < .001$) and also between STPIS and SwoTS ($P < .001$). Moreover, a significant moderate positive correlation was identified between SwoTS and DSS scores ($P < .001$). There was a significant strong negative correlation between $TOTPAR_{0-120\ min}$ and STPIS scores ($P < .05$) but a significant weak negative correlation between $TOTPAR_{0-120\ min}$ and SwoTS scores ($P < .001$). Though a very weak negative correlation was observed between $TOTPAR_{0-120\ min}$ and DSS scores, this association was not statistically significant ($P > .05$). For all the recruited patients, as STPIS ($P < .001$) and SwoTS scores ($P < .05$) increased, $TOTPAR_{0-120\ min}$ decreased. DSS exerted no significant effect on $TOTPAR_{0-120\ min}$ ($P > .05$).

4 | DISCUSSION

This prospective, randomised, double-blind study was intended to compare the efficacy of IV dexketoprofen and paracetamol drugs administered to relieve sore throat pain during emergency admissions. In this regard, the most striking finding to emerge from our analysis is that both drugs proved effective in relieving sore throat pain and that they showed similar analgesic efficacy, with no significant clinical difference between them. Previous published reports cite dexketoprofen and paracetamol as potent analgesic drugs recommended as the first-line analgesia of choice to manage moderate to severe sore throat pain. To the best of our knowledge, ours is the

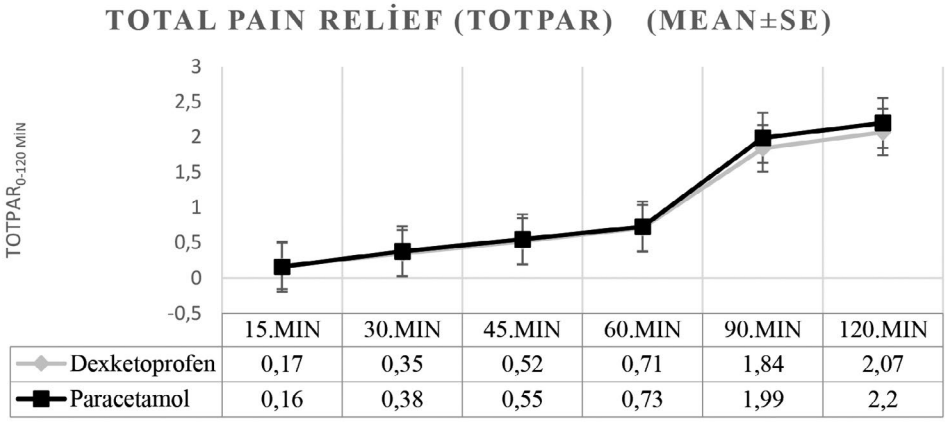

FIGURE 2 Total pain relief score 0-120 minutes

TABLE 3 Change of SwoTS, STPIS and DSS by time according to drug groups

	Dexketoprofen	Paracetamol	P^{*}		Dexketoprofen	Paracetamol	P^{*}		Dexketoprofen	Paracetamol	P^{*}
STPIS score ± SD 0.MIN.	75.28 ± 14.03	76.32 ± 16.73	.460	DSS score ± SD 0.MIN.	66.31 ± 22.95	62.86 ± 28.2	.688	SwoTS score ± SD 0.MIN.	63.64 ± 22.15	57.6 ± 28.04	.105
STPIS score ± SD 15.MIN.	68.16 ± 13.93	70.67 ± 14.91	.281	DSS score ± SD 15.MIN.	56.77 ± 22.37	56.27 ± 27.27	.753	SwoTS score ± SD 15.MIN.	58.1 ± 22.03	2.15 ± 26.84	.107
STPIS score ± SD 30.MIN.	57.29 ± 15.32	56.57 ± 16.82	.609	DSS score ± SD 30.MIN.	44.83 ± 21.46	45.88 ± 26.25	.571	SwoTS score ± SD 30.MIN.	46.32 ± 22.59	42.72 ± 25.69	.475
STPIS score ± SD 60.MIN.	42.56 ± 18.04	43.55 ± 17.25	.668	DSS score ± SD 60.MIN.	33.01 ± 19.43	32.37 ± 21.67	.838	SwoTS score ± SD 60.MIN.	37.69 ± 21.31	31.75 ± 22.45	.075
STPIS score ± SD 90.MIN.	32.21 ± 18.73	32.74 ± 17.02	.919	DSS score ± SD 90.MIN	26.04 ± 18.61	26.77 ± 21.67	.976	SwoTS score ± SD 90.MIN.	28.25 ± 19.29	23.47 ± 19.56	.097
STPIS score ± SD 120.MIN.	26.42 ± 17.36	25.49 ± 17.72	.600	DSS score ± SD 120. MIN	22.02 ± 16.86	23.30 ± 18.66	.917	SwoTS score ± SD 120.MIN.	25.08 ± 19.10	20.29 ± 18.35	.089
P^{**}	<.001	<.001		P^{**}	<.001	<.001			P^{**}	<.001	<.001

Abbreviations: DSS, difficulty swallowing scale; SD, standard deviation; STPIS, sore throat pain ıntensity scale; SwoTS, swollen throat scale.

*P values were derivated from Mann–Whitney U test (measure between two groups).

**P Values were derivated from Friedman test (measure into each groups).

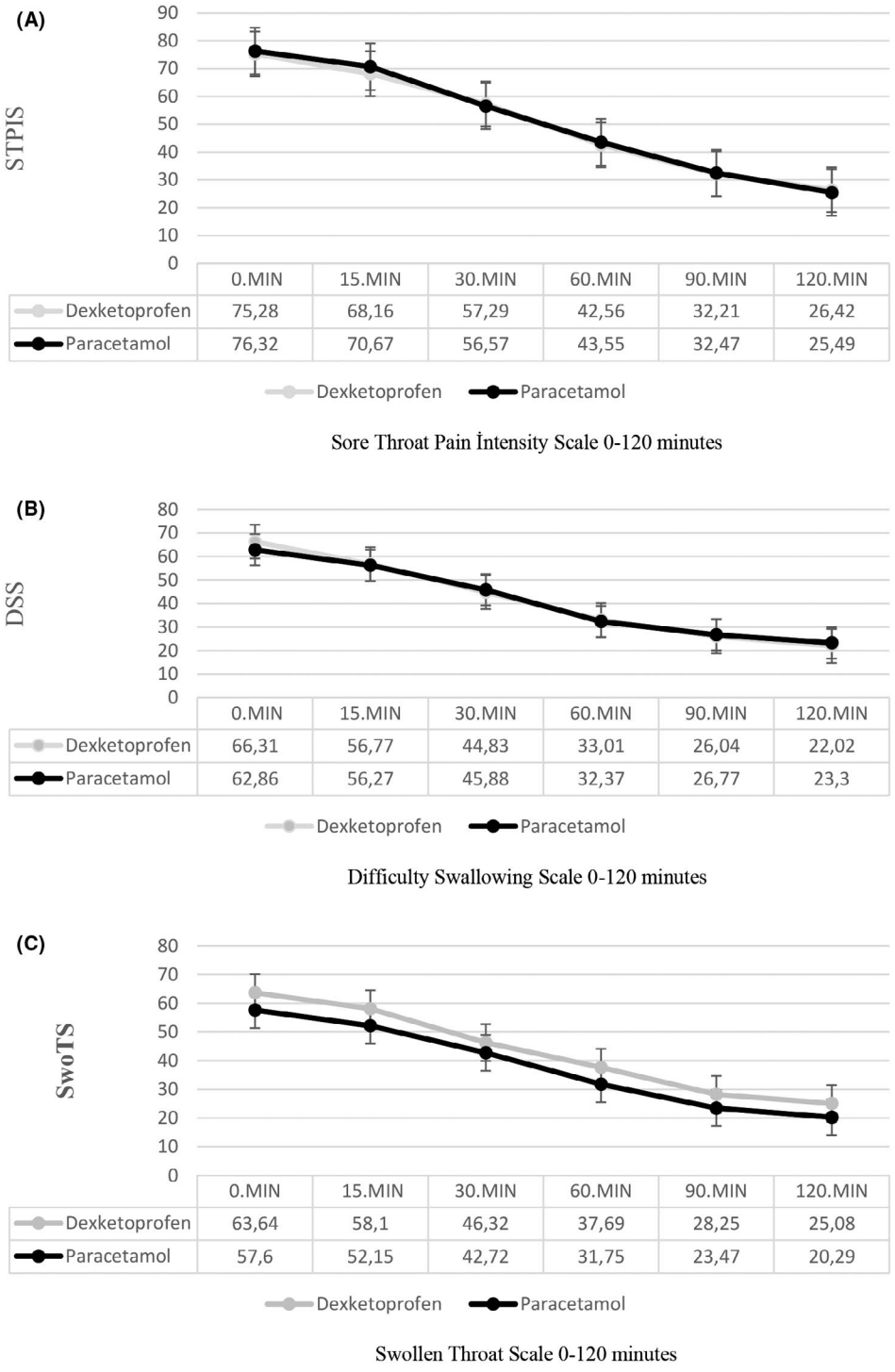

FIGURE 3 A, Sore throat pain intensity scale 0-120 minutes. B, Difficulty swallowing scale 0-120 minutes. Swollen throat scale 0-120 minutes

first study addressing the comparative efficacy of IV forms of these two drugs in controlling sore throat pain in ED.

These two drug groups are frequently preferred in the palliative treatment of sore throat. Especially oral forms are highly recommended by many physicians in the palliation of URTI-induced sore throat. In addition, many lines of evidence exist in the literature on the chronic use of oral forms of these drugs. For instance, Russo et al provided a comparative evaluation of flurbiprofen granule and placebo in eight primary care centres in Australia with 373 patients presenting with URTI-related sore throat. Relief in sore throat started from the first minute, and flurbiprofen was reported to maintain this relief over the course of minimum 6 hours. Their multidose efficacy findings revealed decreased swallowing difficulty from the end of Day 1 to the end of Day 3 and reduced throat pain by the end of Day 1. The researchers concluded that flurbiprofen could be utilised as a substitute for antibiotics in the management of non-bacterial sore throats.[8] Though we

consider analgesic therapy as appropriate for pain palliation, we believe it is hardly likely to function as an alternative to antibiotherapy.

Akil et al tried to address the analgesic efficacy of IV paracetamol and dexketoprofen relative to each other in controlling perineal pain induced by vaginal delivery. In this randomised and controlled trial, 50-mg dexketoprofen (n = 49) and 1000-mg paracetamol (n = 46) were given as IV infusion to two different groups. In terms of VAS scores at 60 minutes, no significant difference was evident in pain relief relative to baseline levels. Considering that pain decreased by 70% in the dexketoprofen group versus 62% in the paracetamol group ($P = .502$), both drugs were concluded to provide pain relief effectively following episiotomy and perineal repair, with no significant difference between them.[9] As in Akil et al's trial, dexketoprofen and paracetamol also provided pain relief equally in our study, with no significant clinical difference between them.

In another clinical trial, Akıncı et al administered 50-mg dexketoprofen or 1-g paracetamol parenterally to 80 patients aged between 18 and 75 before an endoscopic retrograde cholangio pancreatography (ERCP) intervention. The patients were randomly assigned into three groups which received no drug (n = 26), dexketoprofen 50-mg IV (n = 27), and paracetamol 1-g IV (n = 27). They were then transferred to the ERCP unit and monitored. When they reported to suffer pain, 0.5-1 mcg/kg IV fentanyl was administered. The researchers recorded hemodynamic effects, additional analgesic requirement, intraoperative and postoperative side effects, pain intensity as well as endoscopist and patient satisfaction. Their results revealed that the need for additional fentanyl was significantly lower in the dexketoprofen cohort than in its counterparts ($P < .05$). In ERCP operations administered with sedoanalgesia, parenteral 50-mg dexketoprofen was reported to provide better pain control than paracetamol and absence of drug without affecting recovery process and thus decreased narcotic analgesic requirement as well as unwanted adverse effects.[10]

Ceyhan et al compared the analgesic efficacy of dexketoprofen and paracetamol in postoperative pain on 96 patients undergoing non-malignant gynaecological laparotomy. The study population was randomly divided into three cohorts given 50-mg IV dexketoprofen, 1-g of IV paracetamol, and 500 mg of IV paracetamol + 25-mg IV dexketoprofen 15 minutes prior to the end of surgery and at the eighth and 16th hours postoperatively. All the groups were administered with postoperative morphine infusion. Overall morphine consumption, VAS scoring, patient satisfaction and adverse events were evaluated at the end of the postoperative 24th hour. The VAS scores at the 24th hour were reported to be lower in the paracetamol + dexketoprofen group than its counterparts, which was significant in comparison to the dexketoprofen group ($P < .001$). Moreover, the least number of side effects were detected in the paracetamol + dexketoprofen group. No significant difference was evident between the three cohorts in relation to morphine consumption. As a result, the IV administration of dexketoprofen and paracetamol along with morphine was concluded to provide effective analgesia in addition to causing fewer adverse effects after gynaecological abdominal surgery.[11]

In another randomised, controlled study on paracetamol and dexketoprofen, Demirozogul et al scrutinised the effectiveness of these drugs in controlling non-traumatic musculoskeletal pain in ED. The mean decrease in VAS scores was reported as 6.44 ± 1.71 cm in paracetamol group and 7.09 ± 1.44 cm in dexketoprofen group ($P = .001$). Their analysis documented that both drugs significantly reduced non-traumatic musculoskeletal pain in neck, shoulder, back and hip–knee and that these drugs showed no superiority to each other in terms of analgesic efficacy.[12] Consistent the results of this study, the overall findings in our study established that paracetamol and dexketoprofen provided equal pain relief, with no evident superiority to one another.

Yılmaz et al also reported that pain induced by acute musculoskeletal trauma was alleviated effectively with IV infusion of paracetamol and dexketoprofen in ED.[13] In all the aforementioned clinical studies, IV forms of dexketoprofen and paracetamol reportedly functioned well in the management of pain, exerting similar effects in different types of pains.

Tunalı et al conducted a comparative investigation of IV paracetamol and dexketoprofen with respect to analgesic efficacy and morphine consumption after lumbar disc surgery. Patient-controlled analgesia with morphine was provided to all the subjects postoperatively during 24 hours. The patients were randomly assigned to receive 1-g IV paracetamol, 50-mg IV dexketoprofen, and isotonic saline (as placebo), and their VAS values, morphine consumption, and morphine-associated adverse effects were recorded. The pain scores turned out to be lower in dexketoprofen cohort than the other groups ($P = .01$), yet no significant difference was noted in overall morphine consumption and morphine-induced adverse effects.[14] As far as our results are concerned, dexketoprofen did not provide an advantage over paracetamol in relation to analgesic efficacy. Given the congestion and fast-paced working environment in ED, this rapid infusion of dexketoprofen and paracetamol might be an appropriate approach to managing sore throat pain in ED. Another aspect deserving attention is that no side effects were reported by the enrolled patients during rapid infusion therapy with dexketoprofen and paracetamol.

4.1 | Limitations

One major limitation of this study lies in the fact that our data and results based on a small population specific to a particular region might not yield the same outcomes in other settings and institutions with a different sample population. Besides, no follow-up data are available as to the status of our patients' recurrent pain or their admission to another medical facility due to sore throat. Further studies are warranted to identify ideal analgesia in patients with sore throat pain.

5 | CONCLUSION

The obtained results from this prospective, randomised, double-blind, controlled trial provide some clinical evidence that IV infusion

of paracetamol and dexketoprofen can reduce sore throat pain significantly. These results seem to confirm previous evidence garnered from research on sore throat pain in that IV forms of dexketoprofen and paracetamol can alleviate this pain effectively and provide similar analgesic efficacy. Both drugs appear to be suitable therapeutic options for patients admitted to ED with complaints of sore throat pain.

DISCLOSURES

The author declares no conflict of interests.

DATA AVAILABILITY STATEMENT

Data available on request from the authors. The data sets generated and/or analyzed during the current study are available from Cimen Uzeyir, MD.

ORCID

Atakan Yilmaz https://orcid.org/0000-0002-9773-5681

REFERENCES

1. Sauvage JP, Ditisheim A, Bessede JP, David N. Double-blind, placebo-controlled, multi-centre trial of the efficacy and tolerance of niflumic acid ('Nifluril') capsules in the treatment of tonsillitis in adults. *Curr Med Res Opin*. 1990;11:631-637.
2. Ozdemir S, Ozturk TS, Metiner Y, Ak R, Ocal O. Evaluation of the prescriptions written for upper respiratory tract infection. *North Clin Istanb*. 2015;2:107-114.
3. Schachtel BP, Fillingim JM, Thoden WR, Lane AC, Baybutt RI. Sore throat pain in the evaluation of mild analgesics. *Clin Pharmacol Ther*. 1988;44:704-711.
4. Schachtel BP, Fillingim JM, Beiter DJ, Lane AC, Schwartz LA. Rating scales for analgesics in sore throat. *Clin Pharmacol Ther*. 1984;36:151-156.
5. Schachtel BP, Aspley S, Shephard A, Shea T, Smith G, Schachtel E. Utility of the sore throat pain model in a multiple-dose assessment of the acute analgesic flurbiprofen: a randomized controlled study. *Trials*. 2014;3:263.
6. Bouroubi A, Donazzolo Y, Donath F, et al. Pain relief of sore throat with a new anti-inflammatory throat lozenge, ibuprofen 25 mg: A randomised, double-blind, placebo-controlled, international phase III study. *Int J Clin Pract*. 2017;71:e12961.
7. Dworkin RH, Nagasago EM, Hetzel RD, Farrar JT. Assessment of pain and pain-related quality of life in clinical trials. In: Turk DC, Melzack R, eds. *Handbook of Pain Assessment, chapter 34*. New York: Guilford Press; 2001:659-692.
8. Russo M, Bloch M, Looze F, Morris C, Shephard A. Flurbiprofen microgranules for brelief of sore throat: a randomised, double-blind trial. *Br J Gen Pract*. 2013;63:149-155.
9. Akil A, Api O, Bektas Y, Onan Yilmaz A, Yalti S, Unal O. Paracetamol vs dexketoprofen for perineal pain relief after episiotomy or perineal teartear. *J Obstet Gynaecol*. 2014;34:25-28.
10. Akinci N, Bakan N, Karaoren G, et al. Comparison of clinical effects of dexketoprofen and paracetamol used for analgesia in endoscopic retrograde cholangiopancreatography. *Turk J Anaesthesiol Reanim*. 2016;44:13-20.
11. Ceyhan D, Bilir A, Güleç MS. Evaluation of the analgesic efficacy of dexketoprofen added to paracetamol. *Turk J Anaesthesiol Reanim*. 2016;44:312-316.
12. Demirozogul E, Yilmaz A, Ozen M, Turkcuer I, Seyit M, Arikan C. Intravenous dexketoprofen versus paracetamol in non-traumatic musculoskeletal pain in the emergency department: a randomized clinical trial. *Am J Emerg Med*. 2019;37:2136-2142.
13. Yilmaz A, Sabirli R, Ozen M, et al. Intravenous paracetamol versus dexketoprofen in acute musculoskeletal trauma in the emergency department: a randomised clinical trial. *Am J Emerg Med*. 2019;37:902-908.
14. Tunali Y, Akçil EF, Dilmen OK, et al. Efficacy of intravenous paracetamol and dexketoprofen on postoperative pain and morphine consumption after a lumbar disk surgery. *J Neurosurg Anesthesiol*. 2013;25:143-147.

How to cite this article: Cimen U, Yilmaz A, Cimen YK, et al. Comparative evaluation of intravenous dexketoprofen and paracetamol in the management of pain induced by sore throat. *Int J Clin Pract*. 2021;75:e14511. https://doi.org/10.1111/ijcp.14511