DYNEXAN MUNDGEL®
Clinical study overview

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Pain therapy study in children from six months of age

To determine the efficacy and safety of DYNEXAN MUNDGEL® also in children in a randomised, placebo-controlled, double-blind study (Wolf & Otto, 2015)

A total of 161 children were recruited for the trial in two age groups (Group I: 129 children 4 to 8 years, average age 6.4 years and Group II: 32 children, 6 months to <4 years, average age 1.8 years) with painful conditions in the oral cavity. Pain reduction was measured compared from T1 (pain indicated prior to application) to T2 (10 ± 5 min. after application of the investigational product) and/or to T3 (30 ± 10 min. after application of the study medication). The pain was assessed by the Wong-Baker FACES Pain Rating Scale (see fig. 1), a scale comprised of six schematic faces which symbolise the various degrees of pain (0= No Hurt, 1= Hurts little bit, 2 = Hurts little more, 3 = Hurts even more, 4= Hurts whole lot, 5 = Hurts worst). In addition to the child's pain assessment the parents or legal guardians were asked to assess the pain of the child using the same scale.

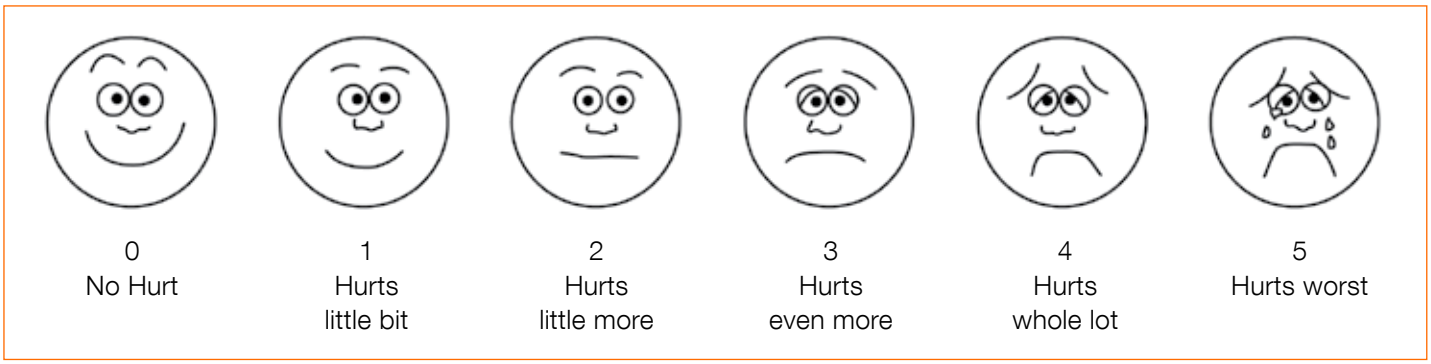

Fig. 1: Wong-Baker FACES Pain Rating Scale

The pain assessment data in Group I could be collected from 107 children (DYNEXAN MUNDGEL® N = 53, Placebo N = 54) at T1, in 109 children (DYNEXAN MUNDGEL® N = 57, Placebo N = 52) at T2 and from 108 children (DYNEXAN MUNDGEL® N = 56, Placebo N = 52) at T3. The remaining children were unable to provide reliable pain assessment data at the respective time (lack of willingness and concentration). The missing values were supplemented with the data provided by the parents or legal guardians as stipulated in the protocol. If both assessments were present, interestingly the children assessed the pain on average somewhat lower than the parents or legal guardians.

As expected, in Group II (DYNEXAN MUNDGEL® N = 32, non-placebo group) the younger children were unwilling and unable to assess the pain so that the parents or legal guardians were asked to provide assessments.

The main cause for pain in the oral cavity in Group I were aphthous ulcers (36%) and in Group II teething (64%).

In Group I (older children) at T2 as well as at T3 there was a statistically significant difference ($p < 0.001$ / $p < 0.002$) in favour of DYNEXAN MUNDGEL® compared to the identical gel prescription without lidocaine. Also if the assessment of the same person (always either the child, parents or legal guardians) was used, the result remained the same.

The children in Group II (younger children) were all treated with DYNEXAN MUNDGEL®, therefore the individual before-after-comparison was used in these subjects (see table 1). None of the younger children showed a worsening of the symptoms, in four patients the pain perception remained the same (12.5%), 13 patients showed improvement of one category in the pain rating (40.6%), seven patients of two (21.9%), five patients of three (15.6%) and three patients (9.4%) of four categories in pain rating from T2 compared to T1. These changes were statistically significant ($p < 0.0001$). After 30 minutes this improvement was even more pronounced.

Pain assessment		**Pain assessment at T2/ T3** *(Data for T3 in italics at the right)*			
		Grade 0	**Grade 1**	**Grade 2**	**Grade 3**
Grade 2	7	.. / *2*	4 / *5*	3 / ..	.. / ..
Grade 3	18	3 / *10*	5 / *6*	9 / *2*	1 / ..
Grade 4	4	1 / *2*	2 / *1*	1 / *1*	.. / ..
Grade 5	3	.. / *2*	2 / *1*	1 / ..	.. / ..

Table 1: Pain assessment Group II: Change between T1 (before application) to T2 (10 ± 5 min. after application) or T3 (30 ± 10 min. after application)

Seven adverse events were observed, such as abdominal pain or bronchitis, none of which were classified as possibly related to the study medication.

Conclusion:

DYNEXAN MUNDGEL® is also an effective and safe local anaesthetic for children aged six months and older.

References: Otto J., Wolf D.: Efficacy and Safety of a Lidocaine Gel in Patients from 6 Months up to 8 Years with Acute Painful Sites in the Oral Cavity: A Randomized, Placebo-Controlled, Double-Blind, Comparative Study

Pain therapy study in children from six years of age

The pain-relieving efficacy of DYNEXAN MUNDGEL® in children was proven in a placebo-controlled, multicenter, randomised, double-blind study (Coudert et al, 2013).

Pain therapy study

A total of 64 boys and girls aged six to fifteen years were included in the clinical trial. The efficacy in patients with acute mucosal pain (aphthous ulcers or injuries caused by orthodontic treatment) and pain reduction to prevent treatment pain, e.g. when placing rubber dam clamps, was examined. A pea size amount of DYNEXAN MUNDGEL® or placebo gel was topically applied (DYNEXAN MUNDGEL® approx. 0.2 g = 4 mg Lidocaine) directly on the painful site in the oral cavity and rubbed in.

The degree of pain was determined using a visual analogue scale (10 cm VAS: 0 = no pain, 10 = strongest imaginable pain) at the beginning (t0) and four minutes after application (t2) (table. 2).

Investigational group	VAS (t_0)	VAS (t_4)	Difference ($\Delta t = t_0 – t_4$)
DYNEXAN MUNDGEL®	3.7	1.8	1.9
Placebo	3.5	2.7	0.8

Table 2: Reduction of pain after application of the study medication

Pain reduction Δt was significantly greater after a treatment time of four minutes in the DYNEXAN MUNDGEL® group compared to the placebo group ($p < 0.005$).

The tolerance was excellent. Within this clinical trial no local or systemic adverse events were observed in the children. Most children considered the taste of the gel to be pleasant.

Conclusion:

DYNEXAN MUNDGEL® is appropriate for local pain relief for mucosal lesions and for preventing pain during dental intervention such as with rubber dam, especially in children, which can enhance compliance.

References: Coudert AE et al.: Phase III, randomized, double-blind, placebo-controlled trial of topical 2 % lidocaine for the prevention and treatment of oral mucosal pain in children. Clin Oral Invest DOI 10.1007/s00784-013-1063-7; Published online: 28 July 2013

Aphthous ulcer study

In a placebo-controlled, randomised double-blind study (Nolting, 1994) the local anaesthetic efficacy of DYNEXAN MUNDGEL® was examined in 84 patients with painful aphthous ulcers (fig. 2) of the oral mucosa.

Aphthous ulcer study

Patient diaries showed that in the DYNEXAN MUNDGEL® group as well as in the placebo group a reduction of the pain could be observed (initial value equals 100%). For the entire investigational period of four days a significant improvement of the pain reduction could be observed (approx. 71.5%) in patients under therapy with DYNEXAN MUNDGEL® compared to only 50% with placebo (fig. 3).

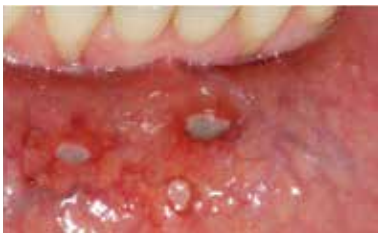

Fig. 2: Aphthous ulcers

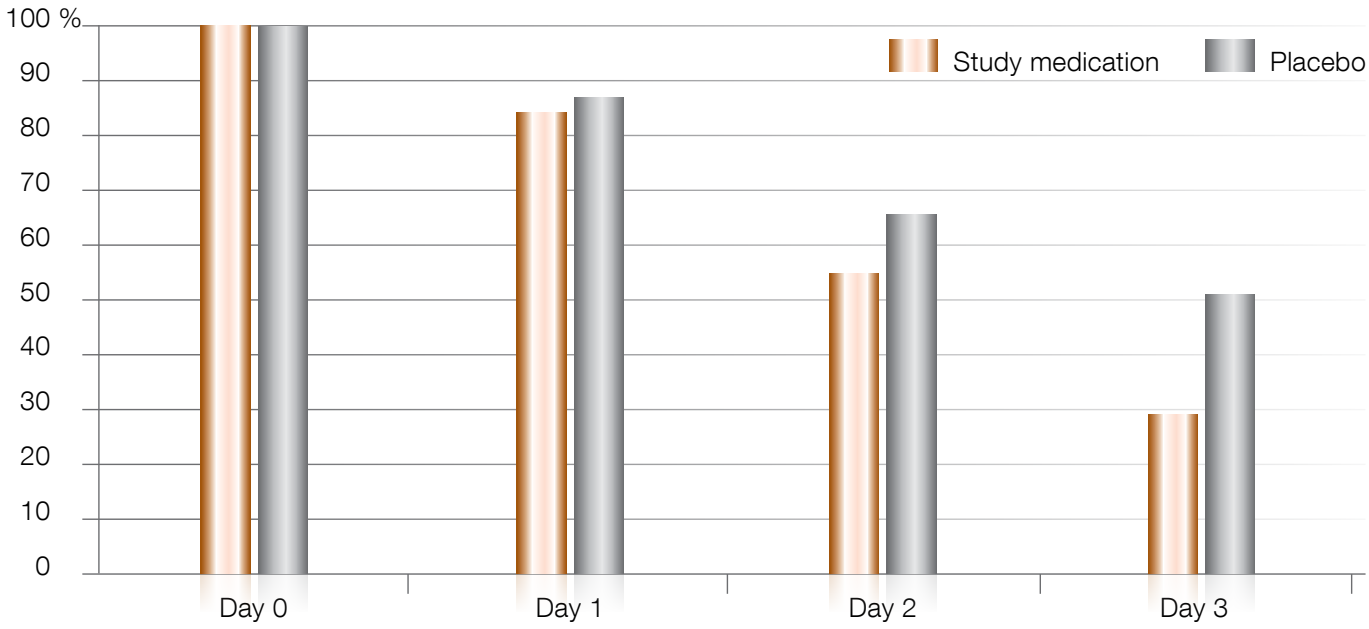

Fig. 3: Intensity of pain in % (Nolting, 1994)

The physicians assessed the efficacy of DYNEXAN MUNDGEL® in 79% of the cases as being “very good” or “good” compared to 46% of placebo applications.

There was no difference observed with regard to local and systemic tolerance of DYNEXAN MUNDGEL® or placebo.

Conclusion:

DYNEXAN MUNDGEL® effectively reduces pain in aphthous ulcers with very good tolerance.

References: Nolting S.: Multicenter, double-blind, placebo-controlled clinical trial (phase IV) with lidocaine and benzalkonium chloride gel to prove the local anaesthetic effect in patients with aphthous ulcers of the oral mucosa. 1994: unpublished

Pressure pain study

In a placebo-controlled, crossover, double-blind study (Gruber et al, 1990) the strength and duration of DYNEXAN MUNDGEL® were examined after application on the gingiva and papilla of healthy subjects compared to placebo gel.

Pressure pain study

During the trial the force was measured using a measuring probe (fig.4) to trigger pressure pain at different time intervals (0, 1, 7, 10, 15, 20, 25, 30, 45 and 60 minutes).

It showed that DYNEXAN MUNDGEL® achieved a statistically significant difference ($p = 0.0063$) and the anaesthetic effect was longer than after application of placebo. DYNEXAN MUNDGEL® began to have an effect already one minute after application and achieved maximum efficacy between the seventh and tenth minute. In percent, the pressure could be increased by 60% before pain was felt. Up to the tenth minute this value increased to 190% before it slowly declined again. The values with placebo only changed slightly on the whole (max. 34% to the initial value; fig. 5).

Fig. 4: Measurement probe

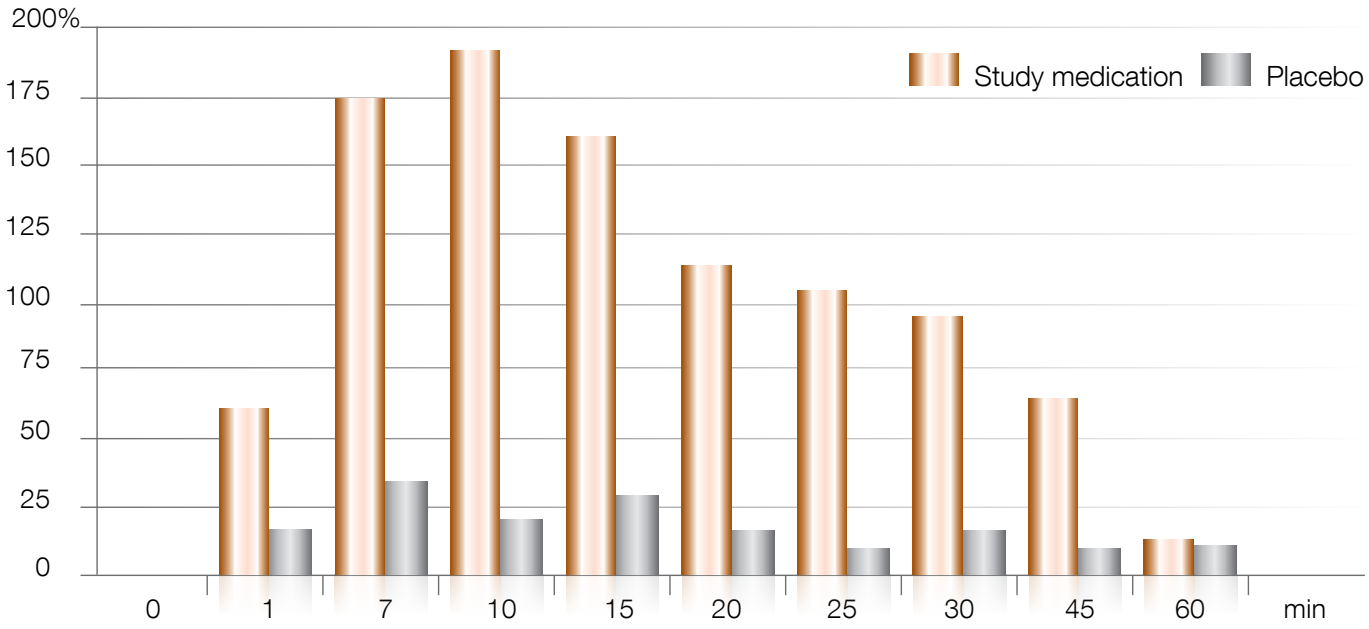

Fig. 5: Comparison of local anaesthetic strength (%) and duration of DYNEXAN MUNDGEL® and placebo (Gruber, 1990)

Conclusion:

DYNEXAN MUNDGEL® causes quick and effective pain relief of pressure pain, e.g. caused by orthodontic treatment and implants

References: Gruber et al.: For local anaesthetic effect of two mucosal preparations on the gingiva. Quintessenz 1990; 10: 1677–82

Wound pain study after periodontal treatment

In a prospective, placebo-controlled, randomised, single-blinded study in split-mouth design (Kasaj et al, 2007) the pain-relieving influence of DYNEXAN MUNDGEL® was examined. An assessment was made about the reduction of wound pain after curettage during non-surgical periodontal therapy (fig. 7).

A total of 40 patients (23 female and 17 male) aged 18 to 60 years were included in the clinical trial. The determination of subjective pain perception was performed using a visual analogue scale (10 cm VAS: 0 = no pain, 10 = strongest imaginable pain).

At the beginning of the study each patient received supragingival and subgingival tartar and plaque removal treatment using conventional ultrasound technique and curettage/ scaling. Six teeth per patient remained untreated. After one week scaling and curettage were performed on the six teeth without a local anaesthetic with simultaneous removal of pocket epithelium and granulation tissue. At the end of the curettage the teeth were rinsed with sterile saline solution (NaCl) and the subjective pain perception was assessed (via VAS). DYNEXAN MUNDGEL® or placebo gel were randomly applied in the 1st or 2nd quadrant subgingivally from the cylinder ampoule with a dull cannula. In the contralateral quadrant only a rinsing with sterile saline solution was performed as a control. The determination of the subjective pain perception of patients was performed after 10, 20 and 30 minutes. Through the use of DYNEXAN MUNDGEL® a reduction of the pain perception compared to the initial value could be achieved.

The difference to the control side was statistically significant at all measured times compared to the initial value ($p <= 0.0001$; table 3). Also the group comparison shows at all three measured times a statistically significant difference between the DYNEXAN MUNDGEL® group compared to the placebo group ($p <= 0.0001$; fig. 7). Although in the placebo group a statistically significant reduction of the pain perception was observed, there was no difference between the test (placebo) and control side (NaCl) in this group.

At no time also after re-examining after one week could adverse events be observed after application of DYNEXAN MUNDGEL®.

Fig. 6: Curettage

VAS (cm)		DYNEXAN MUNDGEL®	NaCl	Placebo	NaCl
Begin	0 min.	5.2	5.8	5.5	6.0
After	10 min.	0.3	4.4	3.2	3.6
After	20 min.	0.3	3.1	2.1	2.5
After	30 min.	0.3	2.3	1.7	2.0

Table 3: Reduction of the subjective pain perception after application of DYNEXAN MUNDGEL® or placebo gel compared to sterile saline solution (NaCl) as a control.

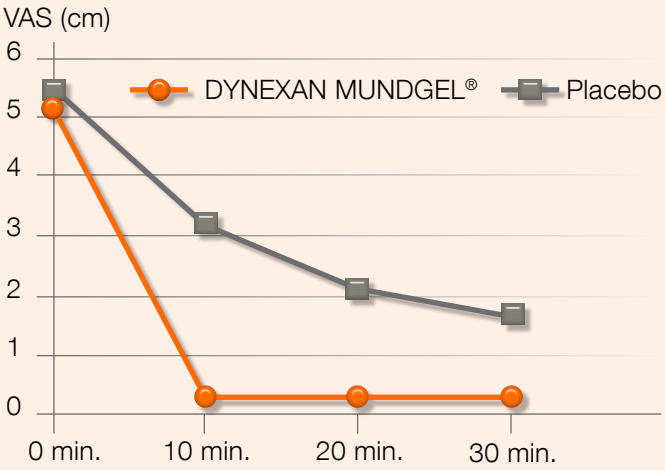

Fig. 7: Subjective pain perception following curettage and application of DYNEXAN MUNDGEL® or .placebo gel

Conclusion:

DYNEXAN MUNDGEL® stops wound pain after non-surgical periodontal therapy (scaling/ root planing).

References: Kasaj A et al.: Effectiveness of a Topical Salve (Dynexan) on Pain Sensitivity And Early Wound Healing Following Nonsurgical Periodontal Therapy. Eur J Med Res 2007; 12:196–199

DYNEXAN MUNDGEL®

Alcohol-free, sugar-free, gluten-free, lactose-free

Professional use

- For application in gingival pockets[1]
- During periodontal therapy and professional teeth cleaning

Household use

- For application on the oral mucosa, gingiva, lips, aphthous ulcers as well as for pressure pain, wound pain and teething[2]

1 Kasaj A., Heib A., Willershausen B.: Effectiveness of a topical salve (DYNEXAN®) on sensitivity and pain on early wound healing following nonsurgical periodontal therapy, Eur J Med Res. 2007; 12: 196-199

2 Gruber I., Schmidt J., Sonnabend E.: For local anaesthetic effect of two mucosal preparations on the gingiva. Quintessenz 1990; 10: 1677-82

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DYNEXAN MUNDGEL® Qualitative and quantitative composition: 1 g gel contains: Active substance: Lidocaine hydrochloride 1H_2O 20 mg;; additional ingredients: Benzalkonium chloride, bitter fennel oil, glycerol, galactomannan, mint oil, paraffin wax peppermint oil, sodium saccharin, high disperse silicon dioxide, star anise oil, thymol, titanium dioxide, white Vaseline, purified water. **Therapeutic indications:** for temporary, symptomatic treatment of pain on the oral mucosa, gingiva and lips. **Contraindications:** absolute: Hypersensitivity to one of the ingredients of Dynexan MUNDGEL or any other acid-amide local anaesthetics. Relative: Patients with severe disorders of the impulse forming and impulse conducting systems of the heart, acute decompensated heart failure and severe kidney and liver diseases. **Side effects:** very rare (< 0.01 % including individual cases): local allergic and non-allergic reactions (e.g. burning, swelling, irritations, itching, urticaria, contact dermatitis, exanthema, pain), changes in taste, numbness, anaphylactic reactions and shock reactions with accompanying symptoms. Last updated: July 2015.
Chemische Fabrik Kreussler & Co. GmbH, D-65203 Wiesbaden, Germany

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Chemische Fabrik Kreussler & Co. GmbH

Rheingaustraße 87-93, 65203 Wiesbaden, Germany
Phone: +49 611 9271-0
Fax: +49 611 9271-111
www.kreussler-pharma.com

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