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A Pharmaceutical and clinical comparison of Nuromol® vs Maxigesic®

Evolving the therapeutic prescribing power of dentists

Conquering dental pain management

Following the advent of Nuromol (Reckitt Benckiser) and Maxigesic (AFT Pharmaceuticals) in 2014, there was a significant increase in consumer dosage confusion leading to concerns of accidental overdose. Additionally, there seemed to be similar confusion within our own dental profession regarding these products, their indications of use, clinical and therapeutic differences and side effect profiles. We as dental practitioners need to have sound pharmaceutical and therapeutic knowledge to appropriately recommend these products (and others) with clear and concise prescribing protocols.

Records from the NSW Poisons Information Centre highlighted a spike in consumer calls, stating they were worried about accidental overdose with the combination products of Nuromol and Maxigesic. This continued to increase in 2016 with reports highlighting an average of more than one call per week. These concerning statistics, coupled with multiple dental colleagues contacting me for correct dosing advice, led me to write this article to further educate the profession on analgesic prescribing in dental pain management, and review sound prescribing protocols.

As Australian registered dentists we are legally allowed to prescribe any medications, both prescription and OTC (over the counter) for any dental indication we are treating. Although we may prescribe only a fraction of

Australian registered medications, we have a legal responsibility to our patients to conduct multiple medical history updates. Hence it is becoming more apparent that we as dental practitioners are expected to understand and appreciate all medications, including their indications, mechanisms of action, dosages, strengths, side effect profiles and potential interactions for both dental and non-dental uses.

For many of us this expected knowledge unfortunately may be minimal or somewhat lacking. Hence this article along with the other two^{1,2} will assist in building sound drug knowledge and prescribing protocols for dental pain management.

Both Nuromol and Maxigesic contain a combination of paracetamol and ibuprofen which were made available within pharmacies as a Schedule 3 medication- otherwise known as an OTC product. These products do not require a prescription but do require the active intervention from a pharmacist (i.e. professional advice) prior to dispensing the product to the patient.

As we should be aware, the following are brief drug monographs for paracetamol and ibuprofen:

Paracetamol:

1. Indications: analgesic and antipyretic actions.
2. MOA: not fully determined but proposed to inhibit prostaglandins inside but not outside the CNS (central nervous system) resulting in antipyretic actions but lacking in anti-inflammatory actions.

3. Selectivity and adverse effects: not identified to be selective and is largely a safe drug, though can increase aminotransferases (an enzyme contained in the liver which can result in liver failure in certain individuals with pre-existing hepatic insufficiencies).

Ibuprofen:

1. Indications: analgesic, antipyretic and anti-inflammatory actions.
2. MOA: inhibit synthesis of prostaglandins by inhibiting cyclo-oxygenase enzyme 1 and 2 (COX-1 and COX-2):
 - Inhibition of COX-1 results in impaired gastric cytoprotection and antiplatelet effects (clinically results in stomach ulcers and bleeding);
 - Inhibition of COX-2 results in anti-inflammatory and analgesic action (clinically results in reduced inflammation/swelling and provides pain relief);
 - Inhibition of both COX-1 and COX-2 results in a reduction in glomerular filtration rate and renal blood flow (clinically results in renal impairment)
3. Selectivity and Adverse effects: most NSAIDs are nonselective, inhibiting both COX-1 and COX-2. The selective COX-2 inhibitors have little to no effect on COX-1 at therapeutic doses while still being associated (to various clinical degrees) with gastro-intestinal adverse effects.

Whilst both products contain 500mg of paracetamol, the ibuprofen strength in Nuromol and Maxigesic are 200mg and 150mg respectively. The clinical differences between the two products stem from their individual ibuprofen concentration. Further confusion may also arise amongst consumers and dental professionals due to Maxigesic and Nuromol differing in dosing instructions and also in their recommended total daily dose.

Each individual manufacturer recommends the following:

- Maxigesic (500mg paracetamol/150mg ibuprofen) recommended dose (for people 12 years and over) is 1-2 tablets every 6 hours as required, to a maximum of eight tablets in 24 hours. This translates to a maximum total dose of 4000mg of paracetamol and 1200mg of ibuprofen per day.
- Nuromol (500mg paracetamol/200mg ibuprofen) recommended dose (for people aged 12-65 years) is one tablet every 8 hours as necessary, to a maximum of three tablets per 24 hours – a total of 1500mg of paracetamol and 600mg of ibuprofen per day.

The main reasoning behind the differences in the manufacturer's recommendations is more or less marketing the ease and convenience of dosing compliance directly to the consumers (our patients). It does not take into account the recommended therapeutic outcome we desire in dentistry, especially in post-surgical procedures.

Furthermore, based on pharmacokinetics, pharmacodynamics and the overall desired therapeutic outcome for our dental requirements, the recommended dosages for an average individual without any pre-existing medical conditions is 1000mg four times daily and 1200mg three times daily (with food), for paracetamol and ibuprofen respectively.

Although two tablets of Nuromol is equivalent to one tablet of Brufen combined with two tablets of Panadol, the overall tablet quantity is less, increasing the patient's compliance. However, being a combined dosage form compared to individual drugs/product, it forbids the trituration of any of the actives separately. Separate products (e.g. Panadol and Brufen) allow better monitoring, substituting, trituration and/or ceasing any particular active compound at any time without affecting the other in comparison to a combination product.

For example:

- Reducing the ibuprofen dose while continuing the paracetamol regimen is not possible;
- Adding a codeine-based analgesic (also containing paracetamol) to the analgesic cocktail (e.g. Panadeine forte- 500mg paracetamol/30mg codeine) will result in overdosing with paracetamol since this active ingredient is also present in Nuromol;
- Substituting another NSAID (selective or non-selective based on individual patient variability and outcome) is unachievable without ceasing Nuromol altogether.

Clinical Recommendations

- When prescribing either Nuromol or Maxigesic, patients must be advised to avoid taking other products containing paracetamol, ibuprofen or other anti-inflammatories (NSAIDs);
- We should remain vigilant when recommending combination products paracetamol/ibuprofen and correctly counsel patients on the potential adverse effects and maximum daily dosages;
- Judiciously follow the analgesic ladder of prescribing principals for pain management – discussed in my previous article³;
- Screen each patient for individual risk factors and their appropriate use of these products, prior to prescribing or recommending them;
- Paracetamol is clinically effective and generally well tolerated at the recommended dose of 1000mg four times daily (total daily dose of 4000mg); spaced out evenly throughout the day (six hourly);
- Ibuprofen has a recommended dental dose of 400mg three times daily with food (maximum daily dose of 2400mg, although 1200mg is recommended based on a more favourable side effect profile while still achieving our desired therapeutic outcome);
- Ibuprofen should be used with caution in certain individuals; older patients and those with kidney disease, history of peptic ulcer disease, asthma, hypertension or heart failure.

When deciding what combination of products to prescribe rather than selecting separate products, this firstly requires an appreciation of the aetiology of the pain and also an understanding of the therapeutic dosage schedule of each individual active compound. Achieving the desired therapeutic outcome for our dental indications results in Maxigesic being inadequate and clinically unfavourable in comparison to Nuromol, which is more desirable for both its constituent concentrations and dosing ability. It provides the same prescribed strength as Brufen and Panadol, though uses less tablets, thereby increasing compliance and reducing poly-pharmacy though still not having the ability to triturate either of the actives separately.

In conclusion, the comparison of analgesic products, Maxigesic and Nuromol, highlighted the differences in dosing based on their varying concentration of ibuprofen. Apart from the advantages previously discussed of utilising individual medications, for freedom of dose modulating, Nuromol is better suited than Maxigesic for its therapeutic dosage requirements in dental pain management (especially following surgical procedures).

Previous articles

1. "Prescribing protocols for optimal pain management in dentistry" (NSW Dentist, March 2018)
2. "TGA Codeine Rescheduling the what, when and why for Australian Dentists" (NSW Dentist, April 2017).