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Potentially Inappropriate Medications for Older Adults in Dental Practice

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ABSTRACT

Objective: The present study aimed to review the medications frequently prescribed in dental practice that are potentially inappropriate for the elderly population due to the risks presented. **Methods:** An integrative literature review was carried out, based on the Guidance Manual: Prescription and Dispensing of Medicines Used in Dentistry, which reports the main drugs prescribed in dental practice (2017). From this, medications described in the Beers list of the American Society of Geriatrics (2019) were extracted, in order to identify medications that are potentially inappropriate in the elderly, what are the main consequences of use and appropriate management in view of the need for prescription. **Results:** The prescription and dispensing guidance manual for medicines used in dentistry has a list of 142 medicines, containing anti-inflammatories, antibacterials, opioids, benzodiazepines and other types of drugs. Of the drugs listed, 27 are considered inadequate and the most common therapeutic class among the drugs was anti-inflammatory drugs, being equivalent to 44.5% of the inadequacies found. **Conclusion:** Despite the risks associated with medications, it appears that they are widely prescribed in dental practice, making these groups worthy of special attention due to their potential for serious adverse events and negative impacts on the elderly and the health system, in addition to to emphasize the importance of the professional regarding the best indications and pharmacotherapeutic follow-up by the clinical pharmacist in caring for the elderly.

Keywords: Dental Care for Aged, Pharmaceutical Preparations, Aged.

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INTRODUCTION

In Brazil, there is an increase in life expectancy justified by public health actions, such as vaccination and basic sanitation, and medical and technological advances. The urbanization and family planning processes also contributed to reducing the fertility rate, probably by increasing the proportion of people over 65 years old. This change in the population profile demands improvements in the health care model, especially with regard to pharmaceutical assistance, with knowledge and training of professionals for the care of this type of patient [1].

The general elderly patient is affected by a greater number of diseases, especially as chronic noncommunicable diseases, patient due to the high consumption of drugs and the risks of drug interactions due to the practice of polypharmacy [1,2]. It is also updated by physiological changes inherent to aging, which compromise the pharmacokinetics and pharmacodynamics of drugs and lead to greater sensitivity to both therapeutic and adverse effects. [1.3]

The growth of the elderly population contributed to the increase in the demand for dental care for this patient profile, therefore, the dentist's knowledge about medicines is of fundamental importance for the guidelines for prescribing drugs in rational clinical practice. Even if in dentistry the drugs are prescribed for a short period, do not prevent the occurrence of drug interactions with the other drugs already used by the patient, as well as the possible appearance of adverse reactions and / or intoxications. [4.5]

Anxiolytics, analgesics, antibiotics and non-steroidal anti-inflammatory drugs [NSAIDs] are classes of medicines prescribed daily by dental surgeons [5]. However, some drugs are considered unsuitable for use in the elderly due to lack of effectiveness, or the greater risk of adverse effects that outweighs their benefits when compared to other categories of drugs. [1] Thus, this study aimed to review the drugs

frequently prescribed in dental practice that are potentially inappropriate for the elderly population due to the high risks.

METHODS

This is an integrative literature review, based on the Guidance Manual: Prescription and Dispensing of Medicines Used in Dentistry [2017], published by the Regional Pharmacy Council of the state of São Paulo in partnership with the Regional Council of Dentistry of São Paulo, who reports the main drugs prescribed in dental practice. After extracting the frequently prescribed drugs, the Beers List of the American Society of Geriatrics [2019] was used as a basis for identifying drugs of potentially inappropriate use in elderly patients, what are the main consequences of misuse and adequate management in view of the need for prescription.

RESULTS

The guidance manual for prescribing and dispensing medicines used in dentistry has a list of 142 medicines, containing anti-inflammatories, antibacterials, opioids, benzodiazepines and other types of drugs, as shown in Chart 1.

Chart 2 shows potentially inappropriate medications for elderly patients among the drugs frequently prescribed by dentists according to the Beers List of the American Society of Geriatrics [2019]. Of the drugs listed, 27 are considered inadequate and the most common therapeutic class among the drugs was anti-inflammatory drugs, being equivalent to 44.5% of the inadequacies found. Also according to the American Society of Geriatrics [2019], Chart 3 presents the main consequences of misuse and adequate management in view of the need for prescription.

DISCUSSION

According to a study, the therapeutic classes most prescribed by the dentist are analgesics, followed by antibiotics and anti-inflammatory drugs [2]. Although NSAIDs accounted for 44.5% of inappropriate drugs prescribed by dentists for the geriatric population, they are

among the most widely used therapeutic agents worldwide, with large consumers being elderly. These drugs act by inhibiting the synthesis of prostaglandins and thromboxanes and have anti-inflammatory, antipyretic and analgesic

effects, favoring the relief of the level of pain or moderate caused by acute and chronic inflammation in the patient, especially in pain caused by the inflammatory process or tissue injury [6].

Chart 1: Drugs prescribed in dental practice.

Aceclofenac; Acyclovir; Acetylsalicylic acid; Aminocaproic acid; Mefenamic acid; Paraminobenzoic acid; Peracetic acid [2%]; Tranexamic acid; Trichloroacetic acid; Alprazolam; Amikacin; Amitripline; Amoxicillin; Amoxicillin/Clavulanic acid; Ampicillin; AmicilliSulbactam; Amphotericin B; Articaine; Bupivacaine; Carbamazepine; Carbenicillin; Cefaclor; Cefadroxil; Cephalexin; Cephalothin; Cefazolin; Cefepime; Cefotaxime; Cefoxitin; Ceftazidime; Ceftriaxone; Cefuroxime; Celecoxib; Cetirizine; Ketoprofen; Ketorolac; Cevimeline; Cyclobenzaprine; Ciprofloxacin; Clarithromycin; Clindamycin; Cetylpyridinium chloride; Chlorhexidine; Clobetasol; Cloxazolam; Codeine; Cortisone; Dehydroepiandrosterone [Androstenolone]; Desloratidine; Dexamethasone; Diazepam; Diclofenac; Dicloxacillin; Diphenhydramine; Diflunisal; Dipyron; Doxycillin; Eltrombopague olamine; Epinephrine; Erythromycin; Ertapenem; Ethylstrenol; Etodolac; Etoricoxib; Phenylbutazone; Fenoprofen; Fentanyl; Fluconazole; Flunitrazepam; Desensitizing fluoride; Fluorides; Fluoxetine; Formaldehyde; Gabapentin; Gemifloxacin; Gentamycin; Glucago; Hydrocortisone; Ibuprofen; Imipeném; Indomentacin; Itraconazole; Levofloxacin; Lidocaine; Loratadine; Lorazepam; Sodium meclofenamate; Meloxicam; Mepivacaine; Meropenem; Methicillin; Methylprednisolone; Metronidazole; Miconazole; Midazolam; Minocycline; Morphine; Moxifloxacin; Nanohydroxyapatite; Naproxen; Nimesulid; Nystatin; Potassium nitrate; Nortripillin; Orfenadrin; Oxacillin; Oxazepam; Oxifembutazon; Paracetamol; Parametasone; Parecoxib; Penciclovir; Carbamide peroxide; Hydrogen peroxide; Pilocarpine; Piperacillin; Piperacillin/Tazobactam; Piroxicam; Prednisolone; Prednisone; Pregabalin; Prilocaine; Promethazine; Ramoplanin; Ranitidine; Rifamide; Roxithromycin; Somatropin; Sulfacetamide; Sulfadiazine; Sulfafurazole; Sulfamethoxazole; Sulindaco; Teicoplanin; Telithromycin; Tenoxicam; Tetracycline; Ticarcillin; Ticarcillin/Clavulanic acid; Thiocolchicoside; Tramadol; Triamcinolone; Triclosan; Trimethoprim; Vancomycin; Venlafaxine; Xylitol..

Source: Guidance Manual: Prescription and Dispensing of Medicines Used in Dentistry [2017].

Chart 2: Potentially inappropriate drugs for the elderly.

Ketoprofen; Ketorolac; Cyclobenzaprine; Ciprofloxacin; Diazepam; Diclofenac; Diflunisal; Etodolac; Fenoprofen; Gabapentin; Ibuprofen; Indomentacin; Lorazepam; Sodium meclofenamate; Meloxicam; Morphine; Naproxen; Nortripillin; Orfenadrin; Oxazepam; Piroxicam; Pregabalin; Promethazine; Ranitidine; Sulindaco; Tramadol; Trimethoprim.

Source: American Society of Geriatrics [2019].

Chart 3: Consequences of the misuse of drugs and proper management in face of the need for prescription.

| Potentially inappropriate medication for the elderly | Use in dental practice | Risck according to Beers List [2019] | Recommendations according to Beers list [2019] |
|--|------------------------|---|---|
| Ketoprofen | Anti-inflammatory | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not |

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| | | | effective and the patient can use gastroprotectants. |
| Ketorolac | Anti-inflammatory | Increased risk of gastrointestinal bleeding and acute kidney injury. | Avoid. |
| Cyclobenzaprine | Treatment of temporomandibular dysfunction and other extreme conditions where muscle spasms occur. | Anticholinergic adverse effects, sedation, increased risk of fractures. | Avoid. |
| Ciprofloxacin | Bacterial infectious processes. | Increased risk of CNS* effects [seizures, confusion] and tendon rupture. | Dosage reduction [CrCl <30mL/min] |
| Diazepam | In cases of incidence of the fear, anxiety, phobia factor, among others, which trigger systemic conditions unfavorable to clinical or surgical acts, such as arterial hypertension and tachycardia. | Increased risk of cognitive impairment, delirium, falls and fractures. | Avoid. |
| Diclofenac | Pain control and anti-inflammatory. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Diffenidol | Pain control. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Etoricoxib | Anti-inflammatory. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Phenopropion | Anti-inflammatory. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Gabapentin | Pain control used in painful orofacial disorders. | Increased risk of CNS* effects. | Dosage reduction [CrCl<60 mL/min]. |
| Ibuprofen | Pain control, anti-inflammatory and antipyretic. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Indomethacin | Anti-inflammatory. | Increased risk of gastrointestinal bleeding and acute kidney injury. | Avoid. |
| Lorazepam | In cases of incidence of the fear, anxiety, phobia factor, among others, which trigger systemic conditions unfavorable to clinical or surgical acts, such as arterial hypertension and tachycardia. | Increased risk of cognitive impairment, delirium, falls and fractures. | Avoid |

[Continuation] Chart 3: Consequences of the misuse of drugs and proper management in face of the need for prescription.

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| Sodium meclofenamate | Anti-inflammatory. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Meloxicam | Pain control and anti-inflammatory. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Morphine | Pain control for hospital use, to relieve severe and/or very intense pain. | It can cause ataxia, impaired psychomotor function, syncope and falls. | Avoid overuse for pain control in the acute pain environment [for example, recente fractures or joint replacement]. Consider reducing the use of other active CNS* medications that increase the risk of fracture [example: antiepileptics, opioid receptor agonists, antipsychotics, antidepressants and benzodiazepines]. |
| Naproxen | Pain control and anti-inflammatory. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where alternatives are not effective and the patient can use gastroprotectants. |
| Nortriptyline | Coadjuvant in the treatment and control of chronic pain. | Highly anticholinergic, sedative and causes orthostatic hypotension. | Avoid. |
| Orphenadrine | Treatment of temporomandibular dysfunction [TMD] and other extreme conditions where muscle spasms occur. | Anticholinergic adverse effects, sedation, increased risk of fractures. | Avoid. |
| Oxazepam | In cases of incidence of the fear, anxiety, phobia factor, among others, which trigger systemic conditions unfavorable to clinical or surgical acts, such as arterial hypertension and tachycardia. | Increased risk of cognitive impairment, delirium, falls and fractures. | Avoid. |
| Piroxicam | Pain control and anti-inflammatory. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Pregabalin | Pain control used in painful orofacial disorders. | Increased risk of CNS* effects. | Dosage reduction [CrCl<60 mL/min]. |
| Promethazine | Allergic processes. | Risk of confusion, dry mouth, constipation and other anticholinergic effects or toxicity. | Avoid. |
| Ranitidine | Gastric irritation. | It can cause, induce or aggravate delirium. | Avoid. |
| Sulindaco | Anti-inflammatory. | Gastrointestinal bleeding, peptic ulcer | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |

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| Tramadol | Pain control. | It can exacerbate or cause SIADH or hyponatremia. | Avoid chronic use, except in cases where other alternatives are not effective and the patient can use gastroprotectants. |
| Trimethoprim | Infectious or bacterial processes. | Increased risk of hyperkalaemia when used simultaneously with na ACEI* or BRA* in the presence of decrease creatinine clearance. | Use with care. |

*CNS: Central Nervous System; ACEI: Antiotensin-Converting Enzyme Inhibitors; BRA: Angiotensin receptor blockers. Source: American Society of Geriatrics [2019].

Regarding adverse drug reactions [ADRs], NSAIDs are among its main causes, being responsible for 20 to 25% of ADRs. Non-selective NSAIDs for cyclooxygenase inhibit the production of prostaglandins in the gastrointestinal mucosa, which can cause abdominal discomfort and pain, gastric ulcer and even digestive bleeding. Selective COX-2 inhibitors are safer in the gastric aspect, but increase the risk of cardiovascular complications, especially in users with a predisposition to diseases. Therefore, these drugs need to be administered with caution, especially in elderly patients. [7, 8]

In general, as water-soluble drugs administered orally, they may have increased bioavailability due to the lower water content in the body, which leads to a reduction in their volume of distribution. Fat-soluble drugs, in turn, as is the case with Diazepam, have the highest volume of distribution in the elderly, as a proportion of adipose tissue is not higher. An equally important factor seen in elderly patients is related to the plasma concentration of albumin, which tends to be lower, making the binding of drugs to these proteins also reduced, defeating a greater free fraction of the drug in the plasma and a greater volume of distribution. [1]

Still, alterations associated with the hepatic and renal systems are common. Waiting for the hepatic blood flow to be usually decreased, there is a reduction in the first-pass metabolism of the drugs. Renal reduction may also be impaired, prolonging the plasma half-life of drugs and

increasing the likelihood of causing toxic effects. [1]

CONCLUSION

Potentially inappropriate drugs were found for elderly patients in the anti-inflammatory, opioid, benzodiazepine, antibacterial, antidepressant, antiallergic, anticonvulsant and H2 receptor antagonist classes. Despite the risks associated with the use of medications, it appears that they are widely prescribed in dental practice, making these groups worthy of special attention due to their potential for serious adverse events and negative impacts on the elderly and the health system, in addition to to emphasize the importance of the professional regarding the best indications and pharmacotherapeutic follow-up by the clinical pharmacist in caring for the elderly.

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