

## Prescription of drugs contraindicated in children: a national community survey

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Many drugs are prescribed off-label, which means outside the terms of the summary of product characteristics (SPC) i.e. indication, dosage, contraindication, etc, in children. Among the numerous studies about off-label use, no data have focused on drug use despite contraindication in children.

The aim of this survey was to assess the frequency of prescription despite a contraindication for age in France. Drugs were defined as contraindicated for age if the SPC (as quoted in the French compendium *Le Dictionnaire Vidal*), indicated clearly that the drug is contraindicated in the age group of the patient receiving the prescription [1].

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For each drug contraindicated, the reason given in the SPC for the contraindication for age was classified as “toxic effects described in children”, “insufficient data for use in children”, “unsuitable dosage strength or formulation for the age” or no explanation given. Moreover, to investigate avoidability of a contraindication transgression we searched for an available alternative defined as a product with the same active substance, the same route of administration but in a dosage licensed for children. The study population was children younger than 16 years, affiliated to the French mandatory national health fund (Caisse Nationale d’Assurance Maladie), refunded for prescriptions from office-based practice over 2 months. The use of this database did not need parents’ consent or ethics committee agreement. A total of 276,472 prescriptions including 1,068,705 drugs were refunded for children younger than 16 years. Of these, 11,138 prescriptions (4%) included at least one drug contraindicated for age i.e. 12,333 drugs contraindicated for age (1.2%). This percentage of contraindicated drugs is slightly higher than that found in two other studies (0.9% [7] 0.04% [5]), but the aim of the latter was to assess off-label use. We found that the rate of prescriptions contraindicated for age increased with age (Table 1), while the frequency of off-label prescription decreased with age in other studies [4, 6]. The lower rates of drugs contraindicated for age in younger children is probably partly due to a greater reluctance on the part of physicians to go beyond contraindication for age in this group.

Among 5,911 prescribers, 48.4% prescribed at least one drug contraindicated for age. This rate was highest among general practitioners (78.6%) and paediatricians (74.4%).

Therapeutic classes most frequently prescribed that were contraindicated for age were topical and systemic drugs for ear, nose and throat (ENT) symptoms (24.5%), topical

**Table 1** Drug prescriptions

	Patients		Drugs	
	Total	Percentage with contraindication for age	Total	Percentage with contraindication for age
Neonates	3,566	0.7%	8,532	0.3%
Infants	57,238	3.2%	295,765	0.7%
Children				
2–6 years	81,544	2.6%	351,732	0.7%
6–12 years	81,598	3.8%	249,768	1.4%
Adolescents	52,526	7.7%	162,908	2.8%
Total	276,472	4.0%	1,068,705	1.2%

drugs for joint and muscle pain (20%), type 1 antihistamines (14.5%), and nonsteroidal anti-inflammatory drugs (NSAIDs) (13%).

The most frequent drugs prescribed despite contraindication were vasoconstrictors among drugs used for ENT symptoms, topical NSAIDs among drugs used for joint and muscle pain, loratadine tablets (contraindicated for children younger than 6 years) among type 1 antihistamines, loperamide oral suspension (contraindicated for children younger than 2 years) among anti diarrhoeal drugs and association of paracetamol and dextropropoxyphen among analgesics.

Reasons given in the SPC for the contraindication for age were toxic effects (7%), insufficient data (6.7%), unsuitable formulation (6.4%) or dose (1%). However, for most drugs (79%) no explanation for contraindication in children was available in the SPC, as was also found in a German study (75%) [3]. Formulation was a significant problem in children from 2 to 6 years (4.3/1,000). Infants from 1 to 24 months were the age group most likely to receive a drug contraindicated for their age (6.65/1,000) on the basis of toxic effects in children.

In 1,701 (14%) cases of drugs prescribed despite contraindication for age an authorised alternative exists for the age range concerned. This situation was particularly frequent in children from 6 to 12 years (38%), mainly due to the prescription of loratadine tablets and NSAIDs licensed for adults instead of prescribing formulations of loratadine and NSAIDs licensed for children. This point, which has not been reported to date, should persuade manufacturers to provide physicians with a precise and coherent reason why a drug is contraindicated to avoid such prescribing.

Analysis of the relevance of prescriptions of drugs contraindicated-for-age was not possible because the drug indication is not recorded in the French health insurer database. However, some contraindicated prescriptions were certainly inappropriate, as 13% of NSAIDs were prescribed despite a contraindication for age, whereas six NSAIDs (including ibuprofen authorised for children aged

3 months and older) are licensed for paediatric use. Likewise, because their risk (arterial hypertension, seizures etc. [2]) exceeds their benefit, prescribing vasoconstrictor ENT drugs despite their contraindication in children is inappropriate. Nevertheless, some contraindicated for age drugs prescriptions did seem appropriate. For example, for adolescents it may be preferable to receive a capsule (labelled for adults and contraindicated in children) instead of an oral suspension as long as this does not result in an excessive dose being administered. Likewise, topical NSAIDs, none of which are licensed for children, were among the most common therapeutic classes contraindicated for age prescribed (16%), probably to avoid systemic administration.

## Conclusion

Contraindicated-for-age drug prescribing in children younger than 16 years was rare in this office-based survey and exceptional when the contraindication was based on possible toxic effects in children. Prescribers are probably unaware of some contraindications since 14% of contraindicated for age drug prescriptions were avoidable. Contraindicated-for-age drug prescribing could be decreased by improving the information provided to French prescribers, particularly by providing relevant reasons for contraindication.

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