

## Question n°4

### **Y a-t-il des facteurs favorisant la réaction allergique, inhérents au terrain, aux médicaments, à la technique d'utilisation ? Indication du bilan prédictif**

J-M Malinovsky<sup>1</sup>, D. Vervloet<sup>2</sup>, M-C Laxenaire<sup>3</sup>

<sup>1</sup>Service d'anesthésie-réanimation chirurgicale, CHU, Hôtel-Dieu, 44093 Nantes cedex 01, <sup>2</sup> service de pneumologie-allergologie, CHU, hôpital Sainte-Marguerite, 270 bd Sainte-Marguerite, 13270 Marseille, <sup>3</sup> service d'anesthésie-réanimation chirurgicale, CHU, hôpital central, 29 av Ml de-Lattre-de-Tassigny, CO n°34, 54035 Nancy cedex

## REFERENCES

1. Marcadella E, Hummer-Sigiel M, Gueguen R, Moneret-Vautrin DA, Laxenaire MC. Facteurs de risque d'accidents anaphylactoïdes per-anesthésiques. Ann Méd Nancy 1990;29:31-5.
2. Laxenaire MC, and the members of writing committee. Drugs and other agents involved in anaphylactic shock occurring during anaesthesia. A french multicenter epidemiological inquiry. Ann Fr Anesth Réanim 1993;12:91-6.
3. Laxenaire MC, et le Groupe d'études des réactions anaphylactoïdes peranesthésiques. Epidémiologie des réactions anaphylactoïdes peranesthésiques. Quatrième enquête multicentrique (juillet 1994-décembre 1996). Ann Fr Anesth Réanim 1999;18:796-809.
4. Galletly DC, Treuren BC. Anaphylactoid reactions during anaesthesia. Seven years' experience of intradermal testing. Anaesthesia 1985;40:329-33.
5. Moneret-Vautrin DA, Renaudin JM, Kanny G, Widmer S, Hanesse B, Dezfoulian B. Prospective study of the latent sensitization to muscle relaxants. In: Oehling AK, Huerta Lopez JG, Eds. Progress in Allergy and Clinical Immunology; 1997 October 19-24, 1997; Cancun, Mexico: Hogrefe & Huber Publishers; 1997. p. 361-7.
6. Whittington T, Fisher MM. Anaphylactic and anaphylactoid reactions. Baillière's Clin Anaesth 1998;12:301-23.
7. Charpin D, Benzarti M, Hémon Y, Senft M, Arnaud A, Vervloet D, et al. Atopy and systemic reactions to suxamethonium. J Allergy Clin Immunol 1988;82:356-60.
8. Laforest M, More D, Fisher M. Predisposing factors in anaphylactoid reactions to anaesthetic drugs in an Australian population: the role of allergy, atopy and previous anaesthesia. Anaesth Intensive Care 1980;8:454-9.

9. Baldo BA, Fisher MM, Harle DG. Allergy to thiopentone. *Clin Rev Allergy* 1991;9:295-308.
10. Fisher MM, Munro I. Life-threatening anaphylactoid reactions to muscle relaxants. *Anesth Analg* 1983;62:559-64.
11. Auroy Y, Clergue F, Laxenaire MC, Lienhart A, Péquignot F, Jougl E. Anesthésies en chirurgie. *Ann Fr Anesth Réanim* 1998;17:1324-41.
12. Murat I. Anaphylactic reactions during paediatric anaesthetics: results of the survey of the French Society of Paediatric Anaesthetists (ADARPEF) 1991-1992. *Paediatr Anaesth* 1993;3:339-43.
13. Moneret-Vautrin DA, Laxenaire MC, Bavoux F. Allergic shock to latex and ethylene oxide during surgery for spina bifida. *Anesthesiology* 1990;73:556-8.
14. Slater JE, Mostello LA, Shaer C. Rubber specific IgE in children with spina bifida. *J Urol* 1991;146:578-9.
15. Yassin MS, Sanyurah S, Lierl MB, Fischer TJ, Oppenheimer S, Cross J, et al. Evaluation of latex allergy in patients with meningomyelocele. *Ann Allergy* 1992;69:207-11.
16. Ellsworth PI, Merguerian PA, Klein RB, Rozycski AA. Evaluation and risk factors of latex allergy in spina bifida patients: is it preventable? *J Urol* 1993;150:691-3.
17. Moneret-Vautrin DA, Beaudouin E, Widmer S, Mouton C, Kanny G, Prestat F, et al. Prospective study of risk factors in natural rubber latex hypersensitivity. *J Allergy Clin Immunol* 1993;92:668-77.
18. Michael T, Niggemann B, Moers A, Seidel U, Wahn U, Scheffner D. Risk factors for latex allergy in patients with spina bifida. *Clin Exp Allergy* 1996;26:934-9.
19. Nieto A, Estornell F, Mazon A, Reig C, Nieto A, Garcia-Ibarra F. Allergy to latex in spina bifida: a multivariate study of associated factors in 100 consecutive patients. *J Allergy Clin Immunol* 1996;98:501-7.
20. Bernardini R, Novembre E, Lombardi E, Mezzeti P, Clanferoni A, Danti AD, et al. Prevalence of and risk factors for latex sensitization in patients with spina bifida. *J Urol* 1998;160:1775-8.
21. Porri F, Pradal M, Lemière C, Birnbaum J, Mege JL, Lanteaume A, et al. Association between latex sensitization and repeated latex exposure in children. *Anesthesiology* 1997;86:599-602.
22. Dormans JP, Templeton J, Schreiner MS, Delfico AJ. Intraoperative latex anaphylaxis in children: classification and prophylaxis of patients at risk. *J Pediatr Orthop* 1997;17:622-5.

23. Javeed N, Javeed H, Javeed S, Moussa G, Wong P, Rezai F. Refractory anaphylactoid shock potentiated by beta-blockers. *Catheter Cardiovasc Diag* 1996;39:383-4.
24. Lang DM, Alpern MB, Visintainer PF, Smith ST. Elevated risk of anaphylactoid reaction from radiographic contrast media is associated with both  $\beta$ -blocker exposure and cardiovascular disorders.
25. Lang DM. Anaphylactoid and anaphylactic reactions. Hazards of  $\beta$ -blockers. *Drug Safety* 1995;12:299-304.
26. Hermann K, Ring J. Association between the renin angiotensin system and anaphylaxis. *Adv Exp Med Biol* 1995;377:299-309.
27. Bossi A, Romeo G, Pezzoli A. Side effects, structure and H<sub>2</sub>-receptor antagonists. *Lancet* 1992;336:1366.
28. Lazaro M, Compaired JA, De la Hoz B, Igea JM, Marcos C, Davila I, et al. Anaphylactic reaction to ranitidine. *Allergy* 1993;48:385-7.
29. Mira-Perceval JL, Ortiz JL, Sarrio F, Miralles JC, Hernandez J, Negro-Alvarez JM, et al. Nizatidine anaphylaxis. *J Allergy Clin Immunol* 1996;97:855-6.
30. Greers IA, Fellows K. Anaphylactoid reaction to ranitidine in labour. *Br J Clin Pract* 1990;44:78.
31. Barry JES, Madan R, Hewitt PB. Anaphylactoid reaction to ranitidine in an obstetric patient. *Anaesthesia* 1992;47:360-1.
32. Knapp AB, Grimshaw RSJ, Goldfarb JP, Farkas PS, Rubin M, Rosenstein DL. Cimetidine-induced anaphylaxis. *Ann Intern Med* 1982;97:374-5.
33. Sandhu BS, Requena R. Cimetidine and hypersensitivity. *Ann Intern Med* 1982;97:138.
34. Vervloet D, Nizankowska E, Arnaud A, Seft M, Alazia M, Charpin J. Adverse reactions to suxamethonium and other muscle relaxants under general anesthesia. *J Allergy Clin Immunol* 1983;71:552-9.
35. Fisher MM, Outhred A, Bowey CJ. Can clinical anaphylaxis to anaesthetic drugs be predicted from allergy history? *Br J Anaesth* 1987;59:690-2.
36. Haddi E, Charpin D, Tafforeau M, Kulling G, Lanteaume A, Kleisbauer JP, et al. Atopy and systemic reactions to drugs. *Allergy* 1990;45:236-9.
37. Lagier F, Vervloet D, Lhermet I, Poyen D, Charpin D. Prevalence of latex allergy in operating room nurses. *J Allergy Clin Immunol* 1992;90:319-22.
38. Turjanmaa K. Incidence of immediate allergy to latex gloves in hospital personnel. *Contact Dermatitis* 1987;17:270-5.

39. Arellano R, Bradley J, Susman G. Prevalence of latex sensitization among hospital physicians occupationally exposed to latex gloves. *Anesthesiology* 1992;77:905-8.
40. Ruëff F, Kienitz A, Schöpf P, Hartl WH, Andres HJ, Zaak D, et al. Frequency of natural rubber latex allergy in adults is increased after multiple operative procedures. *Allergy* 2001;56:889-94.
41. Beaudouin E, Pupil P, Jacson F, Laxenaire MC, Moneret-Vautrin DA. Allergie professionnelle au latex: enquête prospective sur 907 sujets du milieu hospitalier. *Rev Fr Allergol* 1990;30:157-61.
42. Levy DA, Charpin D, Pecquet C, Leynadier F, Vervloet D. Allergy to latex. *Allergy* 1992;47:579-87.
43. Aichane A, Bouayad Z, El Outmani A, Afif H, Trombat N, Bahlaoui A. Allergie au latex en milieu hospitalier : résultats d'une étude à Casablanca. *Rev Mal Respir* 1997;14:451-5.
44. Grzybowski M, Ownby DR, Peyser PA, Johnson CC, Schork MA. The prevalence of anti-latex IgE antibodies among registered nurses. *J Allergy Clin Immunol* 1996;98:535-44.
45. Moneret-Vautrin DA, Laxenaire MC. The risk of allergy related to general anaesthesia. *Clin Exp Allergy* 1993;23:629-33.
46. Laxenaire MC, Manel J, Borgo J, Moneret-Vautrin DA. Facteurs de risque d'histaminolibération: étude prospective dans une population anesthésiée. *Ann Fr Anesth Réanim* 1985;4:158-66.
47. Cossart C, Lavaud F, Bernard J, Passemard F, Léchenault F. La banane, l'avocat, le latex: allergie croisée. A propos de deux observations. *Rev Fr Allergol* 1990;30:35.
48. M'Raihi L, Charpin D, Pons A, Bongrand P, Vervloet D. Cross-reactivity between latex and banana. *J Allergy Clin Immunol* 1992;87:129-30.
49. Ceuppens JL, Van Durme P, Dooms-Goosens A. Latex allergy in patient with allergy to fruit. *Lancet* 1992;17:390-1.
50. Lavaud F, Cossart C, Reiter V, Bernard J, Deltour G, Holmquist I. Latex allergy in patient with allergy to fruit. *Lancet* 1992;17:390-1.
51. Pecquet C, Leynadier F. IgE mediated allergy to natural rubber latex in 100 patients. *Clin Rev Allergy* 1993;11:381-4.
52. Bord F. Anesthésie. Allergie au latex et allergies alimentaires. *Rev Fr Allergol* 1993;33:169-70.
53. Fernandez de Corres L, Moneo I, Munoz D, Bernaola G, Fernandez E, Audicana M, et al. Sensitization from chestnuts and bananas in patients with urticaria and anaphylaxis from contact with latex. *Ann Allergy* 1993;70:35-9.

54. Blanco C, Carillo T, Castillo R, Quiralte J, Cuevas M. Avocado hypersensitivity. Allergy 1994;49:454-9.
55. Vandenplas O. Occupational asthma caused by natural rubber latex. Eur Respir J 1995;8:1957-65.
56. Taylor JS, Praditsuwan P. Review of 44 cases including outcome and frequent association with allergic hand eczema. Arch Dermatol 1996;132:265-71.
57. Brehler R, Theissen U, Mohr C, Luger T. "Latex-fruit syndrome": frequency of cross-reacting IgE antibodies. Allergy 1997;52:404-10.
58. Freeman GL. **Cooccurrence** of latex and fruit allergies. Allergy Asthma Proc 1997;18:85-8.
59. Garcia-Ortiz JC, Moyano JC, Alvarez M, Bellido J. Latex allergy in fruit-allergic patients. Allergy 1998;53:538-9.
60. Gallo R, Roncarolo D, Mistrello G. Cross-reactivity between latex and sweet pepper due to prohevein. Allergy 1998;53:1007-8.
61. Mäkinen-Kiljunen S. Banana allergy in patients with immediate-type hypersensitivity to natural rubber latex: characterization of cross-reacting antibodies and allergens. J Allergy Clin Immunol 1994;93:990-6.
62. Alroth M, Alenius H, Turjanmaa K, Mäkinen-Kiljunen S, Reunala T, Pasuolo T. Cross-reacting allergens in natural rubber latex and avocado. J Allergy Clin Immunol 1995;96:167-73.
63. Leonard JC, Morin C, Albecq JF. Allergie au latex et chirurgie orthopédique. Rev Chir Orthop Réparatrice Appar Mot 1996;82:321-6.
64. Lavaud F, Prevost A, Cossart C, Guerin L, Bernard J, Kochman S. Allergy to latex, avocado pear, and banana: evidence for a 30 kd antigen in immunoblotting. J Allergy Clin Immunol 1995;95:557-64.
65. Mikkola JH, Alenius H, Kalkkinen N, Turjanmaa K, Paluoso T, Reunala T. Hevein-like protein domains as a possible cause for allergen cross-reactivity between latex and banana. J Allergy Clin Immunol 1998;102:1005-12.
66. Diaz-Peralez A, Collada C, Blanco C, Sanchez-Monge R, Carillo T, Aragoncillo C, et al. Class I chitinases with hevein-like domain, but not class II enzymes, are relevant chestnut and avocado allergens. J Allergy Clin Immunol 1998;102:127-33.
67. Chen Z, Cremer R, Posch A, Raulf-Heimsoth M, Rihs HP, Baur X. On the allergenicity of Hev b 1 among health care workers and patients with spina bifida allergic to rubber latex. J Allergy Clin Immunol 1997;100:684-93.

68. Posch A, Wheeler CH, Chen Z, Flagge A, Dunn MJ, Papenfuss F, et al. Class I endochitinase containing a hevein domain is the causative allergen in latex-associated avocado allergy. *Allergy* 1999;29:667-72.
69. Fisher MM. The prevention of second anaphylactoid reactions to anaesthetic drugs. *Anaesth Intensive Care* 1981;9:242-6.
70. Laxenaire MC, Moneret-Vautrin DA, Widmer S, Mouton C, Guéant JL. Substances anesthésiques responsables de chocs anaphylactiques. Enquête multicentrique française. *Ann Fr Anesth Réanim* 1990;9:501-6.
71. Didier A, Castor D, Bongrand P, Furstoss R, Forneron P, Senft M, et al. Role of the quartenary ammonium ion determinants in allergy to muscle relaxants. *J Allergy Clin Immunol* 1987;79:578-84.
72. Moneret-Vautrin DA, Guéant JL, Kamel L, Laxenaire MC, el Kholti S, Nicolas JP. Anaphylaxis to muscle relaxants: cross-reactivity studied by radioimmunoassays compared to intradermal tests in 34 cases. *J Allergy Clin Immunol* 1988;82:745-52.
73. Weston A, Assem ESK. Possible link between anaphylactoid reactions to anaesthetics and chemicals in cosmetics and biocides. *Agents Actions* 1994;41:C138-C139.
74. Moneret-Vautrin DA, Mouton C, Widmer S. Anaphylaxie aux myorelaxants. Valeur prédictive des intradermoréactions et recherche de l'anaphylaxie croisée. *Ann Fr Anesth Réanim* 1985;4:186-91.
75. Laxenaire MC, Gastin I, Moneret-Vautrin DA, Widmer S, Guéant JL. Cross-reactivity of rocuronium with other neuromuscular blocking agents. *Eur J Anaesth* 1995;12:55-64.
76. Porri F, Lemière C, Birnbaum J, Guilloux L, Lanteaume A, Didelot R, et al. Prevalence of muscle relaxant sensitivity in a general population: implications for a preoperative screening. *Clin Exp Allergy* 1999;29:72-5.
77. Assem ESK. Anaphylactic anaesthetic reactions. The value of paper radioallergosorbent tests for IgE antibodies to muscle relaxants and thiopentone. *Anaesthesia* 1990;45:1032-8.
78. Moneret-Vautrin DA, Laxenaire MC, Widmer S, Hummer M. Intérêt des prick-tests dans le dépistage de l'anaphylaxie aux myorelaxants. *Ann Fr Anesth Réanim* 1987;6:352-5.
79. Fisher MM, Baldo BA. Persistence of allergy to anaesthetics drugs. *Anaesth Intensive Care* 1992;20:143-6.
80. Leynadier F, Calinaux C, Dry J. Valeur prédictive des tests intradermiques aux curarisants. *Ann Fr Anesth Réanim* 1989;8: 98-101.

81. Thacker MA, Davis FM. Subsequent general anaesthesia in patients with a history of previous anaphylactoid/anaphylactic reaction to muscle relaxant. *Anaesth Intensive Care* 1999;27:190-3.
82. Fisher MM, Merefield D, Baldo B. Failure to prevent an anaphylactic reaction to a second neuromuscular blocking drug during anaesthesia. *Br J Anaesth* 1999;82:770-3.
83. Moneret-Vautrin DA, Kanny G, Guéant JL, Widmer S, Laxenaire MC. Prevention by monovalent haptens of IgE-dependent leucocyte histamine release to muscle relaxants. *Int Arch Allergy Immunol* 1995;107:172-5.
84. Fisher MM, Baldo BA. Immunoassays in the diagnosis of anaphylaxis to neuromuscular blocking drugs: the value of morphine for the detection of IgE antibodies in allergic subjects. *Anaesth Intensive Care* 2000;28:167-70.
85. Binkley K, Cheema A, Sussman G, Moudgil G, O'connor M, Evans S, et al. Generalized allergic reactions during anesthesia. *J Allergy Clin Immunol* 1992;89:768-74.
86. Moneret-Vautrin DA, Widmer S, Guéant JL, Kamel L, Laxenaire MC, Mouton C, et al. Simultaneous anaphylaxis to thiopentone and a neuromuscular blocker: a study of two cases. *Br J Anaesth* 1990;64:743-5.
87. Laxenaire MC, Mata-Bermejo E, Moneret-Vautrin DA, Guéant JL. Life-threatening anaphylactoid reactions to propofol (Diprivan®). *Anesthesiology* 1992;77:275-80.
88. de Léon-Casasola OA, Weiss A, Lema MJ. Anaphylaxis due to propofol. *Anesthesiology* 1992;77:384-6.
89. Fisher MM, Harle DG, Baldo BA. Anaphylactoid reactions to narcotic analgesics. *Clin Rev Allergy* 1991;9:309-18.
90. Harle DG, Baldo BA, Coroneos NJ, Fisher MM. Anaphylaxis following administration of papaveratum. Case report: implication of IgE antibodies that react with morphine and codeine, and identification of an allergenic determinant. *Anesthesiology* 1989;71:489-94.
91. Baldo BA, Fisher MM. Anaphylaxis to muscle relaxant drugs: cross-reactivity and molecular basis of binding of IgE antibodies detected by radioimmunoassay. *Mol Immunol* 1983;20:1393-400.
92. Kajimoto Y, Rosenberg ME, Kytta J, Randell T, Tuominen M, Reunala T, et al. Anaphylactoid skin reactions after intravenous regional anaesthesia using 0.5% prilocaine with or without preservative--a double-blind study. *Acta Anaesthesiol Scand* 1995;39:782-4.
93. Gall H, Kaufmann R, Kalveram CM. Adverse reactions to local anesthetics: analysis of 197 cases. *J Allergy Clin Immunol* 1996;97:933-7.

94. Verrill PJ. Adverses reactions to local anaesthetics and vasoconstrictor drugs. Practitioner 1975;214:380-7.
95. Fisher MM, Bowey CJ. Alleged allergy to local anaesthetics. Anaesth Intensive Care 1997;25:611-4.
96. Winton GB. Anesthesia for dermatologic surgery. J Dermatol Surg Oncol 1988;14:41-54.
97. Ruzicka T, Gerstmeier M, Przybilla B, Ring J. Allergy to local anesthetics: comparison of patch test with prick test and intradermal test results. J Am Acad Dermatol 1987;16:1202-8.
98. Canfield D, Gage T. A guideline to local anesthetic allergy testing. Anesth Prog 1987;34:157-63.
99. Fine PG, Dingman DL. Hypersensitivity dermatitis following suction-assisted lipectomy: a complication of local anesthetics. Ann Plast Surg 1988;20:573-5.
100. Simon R. Adverse reactions to drug additives. J Allergy Clin Immunol 1984;74:623-30.
101. Schwartz HJ, Sher TH. Bisulfite sensitivity manifesting as allergy to local anesthesia. J Allergy Clin Immunol 1985;75:525-7.
102. Schwartz HJ, Gilbert IA, Lenner KA, Sher TH, McFadden ERJ. Metabisulfite sensitivity and local dental anesthesia. Ann Allergy 1989;62:83-6.
103. Dooms-Goosens A, de Alam AG, Degreef H, Kochuyt A. Local anesthetic intolerance due to metabisulfite. Contact Dermatitis 1989;20:124-6.
104. Curley RK, MacFarlane AW, King CM. Contact sensitivity to the amide anesthetics lidocaine, prilocaine, and mepivacaine. Arch Dermatol 1986;122:924-6.
105. Burgess J. Preventing adverse local anesthetic reactions: the use of the skin test. Spec Care Dentist 1987;7:135-6.
106. Klein CE, Gall H. Type IV allergy to amide-type local anesthetics. Contact Dermatitis 1991;25:45-8.
107. Cuesta-Herranz J, De las Heras M, Fernandez M, Lluch M, Figueredo E, Umpierrez A, et al. Allergic reaction caused by local anesthetic agents belonging to the amide group. J Allergy Clin Immunol 1997;99:427-8.
108. Schatz M, Fung D. Anaphylactic and anaphylactoid reactions due to anesthetic agents. Clin Rev Allergy 1986;4:215-27.
109. Fisher MM, Pennington JC. Allergy to local anaesthesia. Br J Anaesth 1982;54:893-.

110. Bircher AJ, Messmer SL, Surber C, Rufli T. Delayed-type hypersensitivity to subcutaneous lidocaine with tolerance to articaine: confirmation in vivo and in vitro tests. *Contact Dermatitis* 1991;34:387-9.
111. Palmer C, Voulgaropoulos D. Management of the parturient with a history of local anesthetic allergy. *Anesth Analg* 1993;77:625-8.
112. Laxenaire MC, et le Groupe d'études des réactions anaphylactoïdes peranesthésiques. Substances responsables des chocs anaphylactiques peranesthésiques. Troisième enquête multicentrique française (1992-1994). *Ann Fr Anesth Réanim* 1996;15:1211-8.
113. deShazo RD, Kemp S. Allergic reactions to drugs and biologic agents. *JAMA* 1997;278:1895-906.
114. Silviu-Dan F, McPhillips S, Warrington RJ. The frequency of skin test reactions to side chain penicillin determinants. *J Allergy Clin Immunol* 1993;91:694-701.
115. Sogn DD, Evans REI, Shepard GM, Casale TB, Condemi J, Greenberger PA, et al. Results of the National Institute of Allergy and Infectious Diseases collaborative clinical trial to test the predictive value of skin testing with major and minor penicillin derivatives in hospitalized adults. *Arch Intern Med* 1992;152:1025-32.
116. Green GR, Rosenblum AH, Sweet LC. Evaluation of penicillin hypersensitivity: value of clinical history and skin testing with penicilloyl-polylysine and penicillin G. A cooperative prospective study of the penicillin group of the American academy of allergy. *J Allergy Clin Immunol* 1977;60:339-45.
117. Nicklas RA, Bernstein IL, Li JT, Lee RE, Spector SL, Dykewicz MS, et al. The diagnosis and management of anaphylaxis, XIII.  $\beta$ -lactam antibiotics. *J Allergy Clin Immunol* 1998;101:S498-S501.
118. Gadde J, Spence M, Wheeler B, Adkinson NFJ. Clinical experience with penicillin skin testing in a large inner-city STD clinic. *Jama* 1993;270:2456-63.
119. Ring J, Messmer K. Incidence and severity of anaphylactoid reactions to colloid volume substitutes. *Lancet* 1977;i:466-9.
120. Laxenaire MC, Charpentier C, Feldman L, Groupe Français d'Etude de la Tolérance des Substituts Plasmatiques. Réactions anaphylactoïdes aux substituts colloïdaux du plasma: incidence, facteurs de risques, mécanismes. Etude prospective multicentrique française. *Ann Fr Anesth Réanim* 1994;13:301-10.
121. Björksten B, Hattevig G, Kjellman B, Ahlstedt S, Richter W. Dextran-reactive antibodies in healthy infants and toddlers--relation to type of feeding. *Int Arch Allergy Appl Immunol* 1982;69:174-8.

122. Sakaguchi M, Yoshida T, Asahi T, Aoki T, Miyatani Y, Inouye S. Development of IgE antibody to gelatin in children with systemic immediate-type reactions to vaccines. *J Allergy Clin Immunol* 1997;99:720-1.
123. Wahl R, Kleinhans D. IgE-mediated allergy reactions to fruit gums and investigation of cross-reactivity between gelatine and modified gelatine containing products. *Clin Exp Allergy* 1989;19:77-80.
124. Ring J. Anaphylactoid reactions to intravenous solutions used for volume substitution. *Clin Rev Allergy* 1991;9:397-414.
125. Porter SS, Goldberg RJ. Intraoperative allergic reactions to hydroxyethyl starch: a report of two cases. *Can Anaesth Soc J* 1986;33:394-8.
126. McHugh GJ. Anaphylactoid reaction to pentastarch. *Can J Anaesth* 1998;45:270-2.
127. Kreimeier U, Christ F, Kraft D, Lauterjung L, Niklas M, Peter K, et al. Anaphylaxis due to hydroxyethyl-starch-reactive antibodies. *Lancet* 1995;346:49-50.
128. Takada M, Tomatsu T, Harada T, Murakami N, Shimonaka H, Dohi S. [Bronchospasm due to anaphylactic reaction to hydroxyethyl starch (Hespan)]. *Masui* 1997;46:397-400.
129. Dieterich HJ, Kraft D, Sirtl C, Laubenthal H, Schimetta W, Polz W, et al. Hydroxyethyl starch antibodies in humans: incidence and clinical relevance. *Anesth Analg* 1998;86:1123-6.
130. Bothner U, Georgieff M, Vogt NH. Assessment of the safety and tolerance of 6% hydroxyethyl starch (200/0.5) solution: a randomized, controlled epidemiology study. *Anesth Analg* 1998;86:850-5.
131. Ljungström KG, William B, Hedin H. Nine years of post-marketing surveillance of dextran 1. *Ann Fr Anesth Réanim* 1993;12:219-22.
132. Bircher A, Hedin H, Berglund A. Probable grade IV dextran-induced anaphylactic reaction despite hapten inhibition. *J Allergy Clin Immunol* 1995;95:633-4.
133. Ljungström KG, Renck H, Hedin H, Richter W, Wiholm BE. Hapten inhibition and dextran anaphylaxis. *Anaesthesia* 1988;43:729-32.
134. Alenius H, Kurup V, Kelly K, Palosuo T, Turjanmaa K, Fink J. Latex allergy: frequent occurrence of IgE antibodies to a cluster of 11 latex proteins in patients with spina bifida and histories of anaphylaxis. *J Lab Clin Med* 1994;123:712-20.
135. Nutter A. Contact urticaria to rubber. *Br J Dermatol* 1979;101:597-8.
136. Leynadier F, Pecquet C, Dry J. Choc anaphylactique peropératoire au latex des gants chirurgicaux: cinq cas. *Presse Med* 1988;17:390-1.

137. Zucker-Pinchoff B, Chandler MJ. Latex anaphylaxis masquerading as fentanyl anaphylaxis: retraction of a case report. *Anesthesiology* 1993;79:1152-3.
138. Meric F, Teitelbaum DH, Geiger JD, Harmon CM, Groner JI. Latex sensitization in general pediatric surgical patients: a call for increased screening of patients. *J Pediatr Surg* 1998;33:1108-12.
139. Ylitalo L, Turjanmaa K, Palosuo T, Reunala T. Natural rubber latex allergy in children who had not undergone surgery and children who had undergone multiple operations. *J Allergy Clin Immunol* 1997;100:606-12.
140. Wrangsjo K, Montelius J, Eriksson M. Tests and pacifiers--an allergy risk for infants? *Contact Dermatitis* 1992;27:192-3.
141. Franklin W. Latex as food allergen. *N Engl J Med* 1999;341:1858.
142. Ownby DR, Ownby HE, McCullough J, Shafer AW. The prevalence of anti-latex IgE antibodies in 1000 volunteer blood donors. *J Allergy Clin Immunol* 1996;97:1188-92.
143. Lebenbom-Mansour MH, Oesterle JR, Ownby DR, Jennett MK, Post SK, Zaglaniczy K. The incidence of latex sensitivity in ambulatory surgical patients: a correlation of historical factors with positive serum immunoglobin E levels. *Anesth Analg* 1997;85:44-9.
144. Frankland A. Latex allergy. *Clin Exper Allergy* 1995;25:199-201.
145. Bende M, Soderland U, Millqvist E. Latex allergy among nurses in an operating unit. *Allergy* 1998;53:454-5.
146. Konrad C, Fieber T, Gerber H, Schuepfer G, Muellner G. The prevalence of latex sensitivity among anesthesiology staff. *Anesth Analg* 1997;84:629-633.
147. Mace SR, Sussmann GL, Liss G, Stark DF, Beezhold D, Thompson R, et al. Latex allergy in operating room nurses. *Ann Allergy Clin Immunol* 1998;80:252-6.
148. Leung R, Ho A, Chan J, Choy D, Lai CK. Prevalence of latex allergy in hospital staff in Hong Kong. *Clin Exp Allergy* 1997;27:167-74.
149. Kibby T, Akl M. Prevalence of latex sensitization in a hospital employee population. *Ann Allergy Asthma Immunol* 1997;78:41-4.
150. Sussmann GL. Latex allergy: its importance in clinical practice. *Allergy Proc* 1992;13:67-9.
151. Brown RH, Schaulbe JF, Hamilton RG. Prevalence of latex allergy among anesthesiologists. *Anesthesiology* 1998;89:292-9.
152. Berky Z, Luciano W, James W. Latex gloves allergy. A survey of the US Army Dental Corps. *JAMA* 1992;268:2695-7.

153. Heese A, Peters KP, Stahl J, Koch HU, Hornstein OP. Häufigkeit und zunahme von typ-I-Allergien gegen gummihandschuhe bei zahnmedizinstudenten. *Hautarzt* 1995;46:15-21.
154. Tarlo SM, Sussman GL, Holnes L. Latex sensitivity in dental students and staff: a cross-sectional study. *J Allergy Clin Immunol* 1997;99:396-401.
155. Bubak ME, Reed CE, Fransway AF, Yunginger JW, Jones RT, Carlson CA. Allergic reactions to latex among health-care workers. *Mayo Clin Proc* 1992;67:1075-9.
156. Sussmann GL, Liss GM, Deal K, Brown S, Cividino M, Siu S, et al. Incidence of latex sensitization among latex glove users. *Allergy Clin Immunol* 1998;101:281-2.
157. Charous BL, Hamilton RG, Yunginger JW. Occupational latex exposure: characteristics of contact and systemic reactions in 47 workers. *J Allergy Clin Immunol* 1994;94:12-8.
158. Boxer M. Hand dermatitis: a risk factor for latex hypersensitivity. *J Allergy Clin Immunol* 1996;98:855-6.
159. Wrangsjo K, van hage-Hamsten M, Osterman K. Glove-related skin symptoms among operating theatre and dental care unit personnel. II. Clinical examination, tests and laboratory findings indicating latex allergy. *Contact Dermatitis* 1994;30:139-43.
160. Wrangsjo K, Osterman K, van hage-Hamsten M. Glove-related skin symptoms among operating theatre and dental care unit personnel. II. Interview investigation. *Contact Dermatitis* 1994;30:102-7.
161. Tarlo SM, Sussmann GL, Contala A, Swanson MC. Control of airbone latex by use of powder-free latex gloves. *J Allergy Clin Immunol* 1994;93:985-9.
162. Baur X, Ammon J, Chen Z, Beckmann U, Czuppon AB. Health risk in hospitals through airbone allergens for patients presensitized to latex. *Lancet* 1993;342:1148-9.
163. Baur X, Chen Z, Allmers H. Can a threshold limit value for natural rubber latex airbone allergens be defined? *J Allergy Clin Immunol* 1998;101:24-7.
164. Heilman D, Jones R, Swanson M, Yunginger J. A prospective, controlled study showing that rubber gloves are the major contributor to latex allergen levels in the operating room. *J Allergy Clin Immunol* 1996;98:325-30.
165. Kujala VM, Reijula KE. Glove-induced dermal and respiratory symptoms among health care workers in one Finnish hospital. *Am J Ind Med* 1995;28:89-98.
166. Jaeger D, Kleinhans D, Czuppon AB, Baur X. Latex-specific proteins causing immediate-type cutaneous, nasal, bronchial, and systemic reactions. *J Allergy Clin Immunol* 1992;89:759-68.

167. Levy D, Allouache S, Chabanne MH, Leynadier F, Burney P. Powder-free protein-poor natural rubber latex gloves and latex sensitization. *JAMA* 1999;271:988.
168. Sussmann GL, Lem D, Liss G, Beezhold D. Latex allergy in housekeeping personnel. *Ann Allergy Asthma Immunol* 1995;74:415-8.
169. Carillo T, Blanco C, Quiralte J, Castillo R, Cuevas M, Rodriguez de Castro F. Prevalence of latex allergy among greenhouse workers. *J Allergy Clin Immunol* 1995;96:699-701.
170. Tarlo SM, Wong L, Ross J, Booth N. Occupational asthma caused by latex in a surgical glove manufacturing plant. *J Allergy Clin Immunol* 1990;85:626-31.
171. Orfan NA, Reed R, Dykewicz MS, Ganz M, Kolski GB. Occupational asthma in a latex doll manufacturing plant. *J Allergy Clin Immunol* 1994;94:826-30.
172. Kanerva L, Leino T. Prevalence of natural rubber latex allergy in hairdressers. *Contact Dermatitis* 1999;41:168-9.
173. Slater JE. Rubber anaphylaxis. *N Engl J Med* 1989;320:1126-30.
174. Tosi LL, Slater JE, Shaer C, Mostello LA. Latex allergy in spina bifida patients: prevalence and surgical implications. *J Pediatr Orthop* 1993;13:709-12.
175. Kelly KJ, Pearson ML, Kurup VP, Havens PL, Byrd RS, Setlock MA, et al. A cluster of anaphylactic reactions in children with spina bifida during general anesthesia: epidemiologic features, risk factors, and latex hypersensitivity. *J Allergy Clin Immunol* 1994;94:53-61.
176. Beaudouin E, Prestat F, Schmitt M, Kanny G, Laxenaire MC, Moneret-Vautrin DA. High risk of sensitization to latex in children with spina bifida. *Eur J Pediatr Surg* 1994;4:90-93.
177. Niggemann B. The prevalence of latex allergy in children seen in a university hospital allergic clinic. *Allergy* 1996;52:665-9.
178. Cremer R, Hoppe A, Korsch E, Kleine-Diepenbruck U, Bläker F. Natural rubber latex allergy: prevalence and risk factors in patients with spina bifida compared with atopic children and controls. *Eur J Pediatr* 1998;157:13-6.
179. Konz KR, Chia JK, Kurup VP, Resnick A, Kelly KJ, Fink JN. Comparison of latex hypersensitivity among patients with neurologic defects. *J Allergy Clin Immunol* 1995;95:950-4.
180. Taylor JS, Cassettari J, Wagner W, Helm T. Contact urticaria and anaphylaxis to latex. *J Am Acad Dermatol* 1989;21:874-7.

181. Kwittken PL, Sweenberg SK, Campbell DE, Pawlowski NA. Latex hypersensitivity in children : clinical presentation and detection of latex-specific immunoglobulin E. *Pediatrics* 1995;95:693-699.
182. Cremer R, Hoppe A, Kleine-Diepenbruck U, Blaker F. The influence of shunted hydrocephalus on the prevalence of allergy to latex in patients with spina bifida. *Eur J Pediatr Surg* 1997;7:47-8.
183. Niggemann B, Buck D, Michael T, Wahn U. Latex provocation tests in patients with spina bifida: who is at risk of becoming symptomatic? *J Allergy Clin Immunol* 1998;102:665-70.
184. Kattan H, Harfi HA, Tiperneni P. Latex allergy in Saudi children with spina bifida. *Allergy* 1999;54:70-3.
185. Mazon A, Nieto A, Estornell F, Nieto A, Reig C, Garcia-Ibarra F. Factors that influence the presence of symptoms caused by latex allergy in children with spina bifida. *J Allergy Clin Immunol* 1997;99:600-4.
186. Chen Z, Cremer R, Baur X. Latex allergy correlates with operation. *Allergy* 1997;52:873.
187. Gold M, Swartz JS, Braude BM, Dolovich J, Shanding P, Glimour RF. Intraoperative anaphylaxis: an association with latex sensitivity. *J Allergy Clin Immunol* 1991;87:662-6.
188. Theissen U, Theissen JL, Mertes N, Brehler R. IgE-mediated hypersensitivity to latex in childhood. *Allergy* 1997;52:665-9.
189. Mertes PM, Mouton C, Fremont S, Brugeronnes B, Moneret-Vautrin DA, Lavaud F, et al. Latex hypersensitivity in spinal cord injured adult patients. *Anaesth Intensive Care* 2001;29:393-9.
190. Kalpaklioglu AF, Aydin G. Prevalence of latex sensitivity among patients with chronic renal failure: a new risk group? *Artif Organs* 1999;23:139-42.
191. Gooptu C, Powell SM. The problems of rubber hypersensitivity (types I and IV) in chronic leg ulcer and stasis eczema patients. *Contact dermatitis* 1999;41:168-9.
192. Danne T, Niggemann B, Weber B, Wahn U. Prevalence of latex-specific IgE antibodies in atopic and nonatopic children with type I diabetes. *Diabetes Care* 1997;20:476-8.
193. Rihs HP, Chen Z, Cremer R, Baur X. HLA class antigens DR4 and DQ8 are associated to hevein, a major allergen of Hevea latex. *Tissue Antigens* 1997;49:92-5.
194. Rihs HP, Cremer R, Chen Z, Baur X. Molecular analysis of DR8 and DQB1 alleles in German spina bifida patients with and without IgE responsiveness to the latex major allergen Hev b 1. *Clin Exp Allergy* 1998;28:175-80.

195. Konrad C, Fieber T, Schupfer G. Anaphylactic reaction to latex in health care workers. *Anesth Analg* 1996;82:1107.
196. Bircher AJ, Laugauer S, Levy F, Wahlr N. Allergens of *Ficus benjamina* in house dust. *Clin Exp Allergy* 1995;25:228-33.
197. Fuchs T, Spitzauer S, Vente C, Hevler S, Rumpold H, Kraft D, et al. Natural latex, grass pollen, and weed pollen share IgE epitopes. *J Allergy Clin Immunol* 1997;100:356-64.
198. Merrett TG, Merrett J, Kekwick R. The prevalence of immunoglobulin E antibodies to proteins of rubber (*Hevea brasiliensis*) latex and grass (*Phleum pratense*) pollen in sera of British blood donors. *Clin Exp Allergy* 1999;29:1572-8.
199. Scheule AM, Beierlein W, Wendel HP, Eckstein FS, Heinemann MK, Ziemer G. Fibrin sealant, aprotinin, and immune response in children undergoing operations for congenital heart disease. *J Thorac Cardiovasc Surg* 1998;115:883-9.
200. Kon NF, Masumo H, Nakajima S, Tozawa R, Kimura M, Maeda S. [Anaphylactic reaction to aprotinin following topical use of biological tissue sealant]. *Masui* 1994;43:1606-10.
201. Orsel I, Guillaume A, Feiss P. Choc anaphylactique à la colle biologique. *Ann Fr Anesth Réanim* 1997;16:292-3.
202. Schlag G, Seifert J. Fibrin sealant, aprotinin, and immune response in children undergoing operations for congenital heart disease. *J Thorac Cardiovasc Surg* 1998;116:1082-3.
203. Brinkmann T, Korfer R, Wenzel HR, Tschesche H, Kleesiek K. Strong crossreaction of human anti-aprotinin antibodies from heart transplant patient with [Arg15] aprotinin. *Immunopharmacology* 1997;35:221-8.
204. Green D, Sanders J, Eiken M, Wong CA, Frederiksen J, Joob A, et al. Recombinant aprotinin in coronary artery bypass graft operations. *J Thorac Cardiovasc Surg* 1995;110:963-70.
205. Mitsuhata H, Takeuchi H, Saitoh J, Hasome N, Horiguchi Y, Shimizu R. An inhibitor of nitric oxide synthase, N omega-nitro-L-arginine-methyl ester, attenuates hypotension but does not improve cardiac depression in anaphylaxis in dogs. *Shock* 1995;3:447-53; discussion 454.
206. Porte RJ, Molenaar IQ, Begliomini B, Groenland TH, Janusziewicz A, Lindgren L, et al. Aprotinin and transfusion requirements in orthotopic liver transplantation: a multicentre randomised double-blind study. EMSALT Study Group. *Lancet* 2000;355:1303-9.

207. Baubillier E, Cherqui D, Dominique C, Khalil M, Bonnet F, Fagniez PL, et al. A fatal thrombotic complication during liver transplantation after aprotinin administration. *Transplantation* 1994;57:1664-6.
208. O'Connor CJ, Roozeboom D, Brown R, Tuman KJ. Pulmonary thromboembolism during liver transplantation: possible association with antifibrinolytic drugs and novel treatment options. *Anesth Analg* 2000;91:296-9.
209. Laxenaire MC, Dewachter P, Pecquet C. Le risque allergique de l'aprotinine. *Ann Fr Anesth Réanim* 2000;19:96-104.
210. Siegel M, Werner M. Allergische Pankreatitis bei einer Sensibilisierung gegen den Kallikrein Trypsin-Inaktivator. *Dtsch Med Wochenschr* 1965;90:1712-6.
211. Pfannschmidt J, Steeg D, Jugert F. Routine intraoperative application of high-dose aprotinin in open heart surgery in adults: antibody formation after first exposure. *Curr Med Res Opin* 1995;13:282-4.
212. Weipert J, Meisner H, Jochum M, Dietrich W. Long-term follow-up of aprotinin-specific immunoglobulin G antibodies after cardiac operations. *J Thorac Cardiovasc Surg* 1997;114:676-8.
213. Scheule AM, Beierlein W, Lorenz H, Ziemer G. Repeated anaphylactic reactions to aprotinin in fibrin sealant. *Gastrointest Endosc* 1998;48:83-5.
214. Scheule AM, Jurmann MJ, Wendel HP, Haberle L, Eckstein FS, Ziemer G. Anaphylactic shock after aprotinin reexposure: time course of aprotinin-specific antibodies. *Ann Thorac Surg* 1997;63:242-4.
215. Scheule AM, Beierlein W, Arnold S, Eckstein FS, Albes JM, Ziemer G. The significance of preformed aprotinin-specific antibodies in cardiosurgical patients. *Anesth Analg* 2000;90:262-6.
216. Dietrich W, Spath P, Ebell A, Richter JA. Prevalence of anaphylactic reactions to aprotinin: analysis of two hundred forty-eight reexposures to aprotinin in heart operations. *J Thorac Cardiovasc Surg* 1997;113:194-201.
217. Martinelli L, Maurelli M, Vigano M. Aprotinin in staged heart transplantation: anaphylactic potential of repeated exposure. *Ann Thorac Surg* 1996;61:1288-9.
218. Freeman JG, Turner GA, Venables CW, Latner AL. Serial use of aprotinin and incidence of allergic reactions. *Curr Med Res Opin* 1983;8:559-61.
219. Bidstrup BP, Harrison J, Royston D, Taylor KM, Treasure T. Aprotinin therapy in cardiac operations: a report on use in 41 cardiac centers in the United Kingdom. *Ann Thorac Surg* 1993;55:971-6.

220. Ceriana P, Maurelli M, Locatelli A, Bianchi T, Maccario R, De Amici M. Anaphylactic reaction to aprotinin. *J Cardiothorac Vasc Anesth* 1995;9:477-8.
221. Schulze K, Graeter T, Schaps D, Hausen B. Severe anaphylactic shock due to repeated application of aprotinin in patients following intrathoracic aortic replacement. *Eur J Cardiothorac Surg* 1993;7:495-6.
222. LaFerla GA, Murray WR. Anaphylactic reaction to aprotinin despite negative ocular sensitivity tests. *Br Med J (Clin Res Ed)* 1984;289:1176-7.
223. Cohen DM, Norberto J, Cartabuke R, Ryu G. Severe anaphylactic reaction after primary exposure to aprotinin. *Ann Thorac Surg* 1999;67:837-8.
224. Ong BC, Tan SS, Tan YS. Anaphylactic reaction to aprotinin. *Anaesth Intensive Care* 1999;27:538.
225. Ryckwaert Y, Barthelet Y, Bonnet-Boyer MC, Rochette A, Capdevila X, d'Athis F. Choc anaphylactique après administration d'une dose-test d'aprotinine en chirurgie orthopédique infantile. *Ann Fr Anesth Reanim* 1999;18:904-8.
226. Zacharisen MC, Nordness ME, Kurup VP. Aprotinin anaphylaxis with a test dose in a child [abstract]. *J Allergy Clin Immunol* 1999;103:126.
227. Diefenbach C, Abel M, Limpers B, Lynch J, Ruskowski H, Jugert FK, et al. Fatal anaphylactic shock after aprotinin reexposure in cardiac surgery. *Anesth Analg* 1995;80:830-1.
228. Greenberger PA, Patterson R. The prevention of immediate generalized reactions to radiocontrast media in high-risk patients. *J Allergy Clin Immunol* 1991;87:867-72.
229. Katayama H, Yamaguchi K, Kozuka T, Takashima T, Seez P, Matsuura K. Adverse reactions to ionic and nonionic contrast media. A report from the Japanese committee on the safety of contrast media. *Radiology* 1990;175:621-8.
230. Barrett BJ, Parfrey PS, McDonald JR, Hefferton DM, Reddy ER, McManamon PJ. Nonionic low-osmolality versus ionic high-osmolality contrast media for intravenous use in patients perceived to be at high risk: randomized trial. *Radiology* 1992;183:105-10.
231. Federle MP, Willis LL, Swanson DP. Ionic versus nonionic contrast media: a prospective study of the effect of rapid bolus injection on nausea and anaphylactoid reactions. *J Comput Assist Tomogr* 1998;22:341-5.
232. Vergera M, Seguel S. Adverse reactions to contrast media in CT: effects of temperature and ionic property. *Radiology* 1996;199:363-6.
233. Yamaguchi K, Katayama H, Takashima T, Kozuka T, Seez P, Matsuura K. Prediction of severe adverse reactions to ionic and nonionic contrast media in Japan: evaluation of

pretesting. A report from the Japanese committee on the safety of contrast media. Radiology 1991;178:363-7.

234. Laroche D, Aimone-Gastin I, Dubois F, Huet H, Gerard P, Vergnaud MC, et al. Mechanisms of severe, immediate reactions to iodinated contrast material. Radiology 1998;209:183-90.
235. Nicklas RA, Bernstein IL, Li JT, Lee RE, Spector SL, Dykewicz MS, et al. The diagnosis and management of anaphylaxis, XV. Anaphylactoid reactions to radiographic contrast media. J Allergy Clin Immunol 1998;101:S503-S504.
236. Halpern JD, Hopper KD, Arredondo MG, Trautlein JJ. Patient allergies: role of selective use of nonionic contrast material. Radiology 1996;199:359-62.
237. Enright T, Chua Lim A, Duda E, Lim DT. The role of a documented allergic profile as a risk factor for radiographic contrast media reaction. Ann Allergy 1989;62:302-5.
238. Kanny G, Moneret-Vautrin DA. Aspects immuno-allergologiques des réactions anaphylactiques aux produits de contraste iodés. Rev Fr Allergol 1996;35:171-5.
239. Genovese A, Stellato C, Marsella CV, Adt M, Marone G. Role of mast cells, basophils and their mediators in adverse reactions to general anesthetics and radiocontrast media. J Allergy Clin Immunol 1996;110:13-22.
240. Stellato C, Casolaro V, Ciccarelli A, Mastronardi P, Mazzarella B, Marone G. General anaesthetics induce only histamine release selectively from human mast cells. Br J Anaesth 1991;67:751-8.
241. Marone G, Stellato C, Mastronardi P, Mazzarella B. Non-specific histamine-releasing properties of general anesthetic drugs. Clin Rev Allergy 1991;9:269-80.
242. Spinhoven P, van Peski-Oostterbaan AS, van der Does AJW, Willems LNA, Sterk PJ. Association of anxiety with the perception of histamine induced bronchoconstriction in patients with asthma. Thorax 1997;52:149-52.
243. Flacke JW, Flacke WE, Bloor BC, Van Etten AP, Kripke BJ. Histamine-release by four narcotics: a double-blind study in humans. Anesth Analg 1987;66:723-30.
244. Naguib M, Samarkandi AA, Bakhamees HS, Magboul MA, El-Bakry AK. Histamine-release haemodynamic changes produced by rocuronium, vecuronium, mivacurium, atracurium and tubocurarine. Br J Anaesth 1995;75:588-92.
245. Caldwell JE, Lau ML, Fisher DM. Atracurium versus vecuronium in asthmatic patients. Anesthesiology 1995;83:986-91.
246. Levy JH, Davis GK, Duggan J, Szlam F. Determination of the hemodynamics and histamine release of rocuronium (Org 9426) when administered in increased doses under N<sub>2</sub>O/O<sub>2</sub>-sufentanil anesthesia. Anesth Analg 1994;78:318-21.

247. Lien C, Belmont MR, Abalos A, Eppich L, Quessy S, Abou-Donia M, et al. The cardiovascular effects and histamine-releasing properties of 51W89 in patients receiving nitrous oxide/opioid/barbiturate anesthesia. *Anesthesiology* 1995;82:1131-8.
248. Lepage JY, Malinovsky JM, Lechevalier T, Cozian A, Pinaud M, Souron R. A pharmacokinetic and pharmacodynamic dose-response and safety study of 51W89 in surgical patients during N<sub>2</sub>O/O<sub>2</sub> anesthesia. *Anesth Analg* 1996;83:823-9.
249. Doenicke A, Lorenz W, Hoernecke R, Nebauer AE, Mayer M. Histamine release after injection of benzodiazepines and of etomidate. A problem associated with the solvent propylene glycol. *Ann Fr Anesth Réanim* 1993;12:166-8.
250. Laxenaire MC, Mata E, Guéant JL, Moneret-vautrin DA, Haberer JP. Basophil histamine release in atopic patients after in vitro provocation with thiopental, Diprivan® and chlormethiazole. *Acta Anaesthesiol Scand* 1991;35:706-10.
251. Moss J, Rosow CE. Histamine release by narcotics and muscle relaxants in humans. *Anesthesiology* 1983;59:330-9.
252. vonBormann B, Sticher J, Ratthey K, Idelberger R, Hempelmann G. Volumensubstitution während akuter normovolämischer Hämodilution. *Infusionstherapie* 1990;17:3-7.
253. Asskali F, Fix FU, Hoos I, Forster H, Dudziak R. Histamine release following i.v. application of hydroxyethylstarch, using sensitive and specific detection in test subjects and patients. *Anaesthetist* 1987;36:242-3.
254. Scott RPF, Savarese JJ, Basta SJ, Embree P, Ali HH, Sunder N, et al. Clinical pharmacology of atracurium given in high dose. *Br J Anaesth* 1986;58:834-8.
255. Savarese JJ, Ali HH, Basta SJ, Scott RPF, Embree PB, Wastila WB, et al. The cardiovascular effects of mivacurium chloride (BW B1090U) in patients receiving nitrous oxide-opiate-barbiturate anesthesia. *Anesthesiology* 1989;70:386-94.
256. Leynadier F, Sansarricq M, Didier JM, Dry J. Dépistage des allergiques aux myorelaxants par prick-tests préchargés. *Presse Méd* 1986;15:2072.
257. Fisher MM. Intradermal testing after anaphylactoid reactions to anaesthetic drugs: practical aspects of performance and interpretation. *Anaesth Intensive Care* 1984;12:115-20.
258. Leynadier F, Sansarricq M, Didier JM, Dry J. Prick tests in the diagnosis of anaphylaxis to general anaesthetics. *Br J Anaesth* 1987;59:683-9.
259. Fisher MM, Bowey CJ. Intradermal compared with prick testing in the diagnosis of anaesthetic allergy. *Br J Anaesth* 1997;79:59-63.
260. Baldo BA, Fisher MM. Diagnosis of IgE-dependent anaphylaxis to neuromuscular blocking drugs, thiopentone and opioids. *Ann Fr Anesth Réanim* 1993;12:173-81.

261. Assem ESK. In vivo and in vitro tests in anaphylactic reactions to anaesthetic agents. *Agents Action* 1991;33:208-11.
262. Guéant JL, Aimone-Gastin I, Namour F, Laroche D, Bellou A, Laxenaire MC. Diagnosis and pathogenesis of the anaphylactic and anaphylactoid reactions to anaesthetics. *Clin Exp Allergy* 1998;28:65-70.
263. Laroche D, Lefrancois C, Gerard JL, Dubois F, Vergnaud MC, Guéant JL, et al. Early diagnosis of anaphylactic reactions to neuromuscular blocking drugs. *Br J Anaesth* 1992;69:611-4.
264. Pepys J, Pepys EO, Baldo BA, Whitwam JG. Anaphylactic/anaphylactoid reactions to anaesthetic and associated agents. Skin prick tests in aetiological diagnosis. *Anaesthesia* 1994;49:470-5.
265. Moneret-Vautrin DA, Laxenaire MC. Anaphylactic and anaphylactoid reactions: clinical presentation. *Clin Rev Allergy* 1991;9:249-58.
266. Vervloet D, Birbaum J, Charpin D, Pradal M. Limits of interpretation of screening tests for anaphylactic shock to muscle relaxants. *Ann Fr Anesth Réanim* 1993;12:187-9.
267. Kosnik M, Music E, Suskovic S, Bajrovic N. Systemic reactions during local anesthesia: the role of allergy testing. *Allergo J* 1999;8:78-81.
268. Sindel LJ, deShazo RD. Accidents resulting from local anesthetics. True or false allergy? *Clin Rev Allergy* 1991;9:379-95.
269. Laxenaire MC, Moneret-Vautrin DA, Guéant JL. Allergie aux agents anesthésiques. Quoi de neuf ? In: Sfar, Ed. Conférences d'Actualisation. 34<sup>e</sup> Congrès d'anesthésie et de réanimation. Paris: Masson; 1992. p. 231-44.
270. Patriarca G, Schiavino D, Nucera E, Milani A. Positive allergological tests may turn negative with no further exposure to the specific allergen: a long-term, prospective, follow-up study in patients allergic to penicillin. *Invest Allergy Clin Immunol* 1996;6:162-5.
271. Wrangsjo K, Wahlberg JE, Axelsson JGK. IgE-mediated allergy to natural rubber in 30 patients with contact urticaria. *Contact Dermatitis* 1988;19:264-71.
272. Leynadier F, Dry J. Allergy to latex. *Clin Rev Allergy* 1991;9:371-7.
273. Turjanmaa K, Laurila K, Mäkinen-Kiljunen S, Reunala T. Rubber contact urticaria. Allergenic properties of 19 brands of latex gloves. *Contact Dermatitis* 1988;19:362-7.
274. Kim KT, Safadi GS, Sheikh KM. Diagnostic evaluation of type I latex allergy. *Ann Allergy Asthma Immunol* 1998;80:66-70.
275. Porri F, Pradal M, Rud C, Charpin D, Alazia M, Gouin F, et al. Is systematic preoperative screening for muscle relaxant and latex allergy advisable? *Allergy* 1995;50:374-377.

276. Kelly KJ, Kurup VK, Reijula KE, Fink JN. The diagnosis of natural rubber latex allergy. *J Allergy Clin Immunol* 1994;93:813-6.
277. Warshaw EM. Latex allergy. *J Am Acad Dermatol* 1998;39:1-24.