Scholars Journal of Medical Case Reports **ISSN 2347-6559 (Online)**
Sch J Med Case Rep 2017; 5(1):60-64 **ISSN 2347-9507 (Print)**

(An International Publisher for Academic and Scientific Resources) DOI: 10.36347/sjmcr.2017.v05i01.020

A Severe Adverse Reaction Case of Meningococcal Vaccination

Ning Tang[1]*, Bing Zhang Rui[2], Zuopeng Liao[2]
[1]Department of Public Health, Flinders University, Australia
[2]Center for Disease Control and Prevention, Yunyang, Chongqing, China

***Corresponding author**
Ning Tang
Email: tang0139@flinders.edu.au and/or nt920000@yahoo.com

Abstract: A severe adverse reaction case of meningococcal vaccination was reported. The injection site in the right upper arm of a seven-year-girl in village school swelled and was in pain several hours after having given the first dose of meningococcal vaccine A. Her skin presented local purple spots one day later. The girl showed drowsiness, pale complexion and appearance, sickness, shortness of breath, weak pulse, swelling and angioedema in the arm, and systemic purple spots ten days later. She was diagnosed as thrombocytopenia and allergic purpura, and was given the combined treatment of anti-infection, anti-allergy, hemostasis, blood transfusion in the county hospital. However, the girl and her parents left the hospital on their own in the next day because of financial problem. She died on their way to their home in the countryside.
Keywords: Meningococcal Vaccination, Adverse Reaction, Symptom, Thrombocytopenic Purpura, Allergic Purpura, Death.

INTRODUCTION

All of medicines, including vaccines, there are chance of side effects [1]. Meningococcal vaccines are safe, but are also able to have side effects or adverse reactions [2]. The most common side effects with meningococcal vaccines are mild, such as mild fever, redness, pain, swelling or a lump at the injection site, headache, tiredness, drowsiness, cry, itching or mild skin rashes, joint or muscle aches, diarrhea, nausea, vomiting, loss of appetite, fussiness or irritability, and usually last no more than 1 to 3 days [2- 4]. Rarely, people who receive meningococcal vaccines may experience more serious adverse effects, such as high-grade fever (between 103-104 degrees Fahrenheit), acute weakness and fatigue, dizziness and fainting, jerking, injection site hypersensitivity, hives, rapid heartbeats, difficulties in breathing, swollen face and throat, hoarseness, wheezing and difficulty in swallowing, paleness, dizziness, stomach cramps, loss of consciousness [5, 6, 4]. Very rarely, recipients of a meningococcal vaccine can have serious allergic reactions (i.e. urticaria) or anaphylaxis, reduction in blood platelets (thrombocytopenia) or unusual bleeding (excessive bleeding or bleeding that does not easily stop), seizure or convulsions, neuritis, paresthesia, encephalitis [7, 2, 1, 6], and develop Guillain-Barré syndrome [8-10]. Extreme rarely, a meningococcal vaccine could result in serious injuries, disability or death, but it was estimated at about 1 in a million doses [11, 2, 1, 12].

CASE REPORT

A seven-year-girl was given the first dose of meningococcal vaccine A in the afternoon at a local village school in Yunyang County according to the regular vaccination plan in the county. The injection site in the right upper arm of the girl presented swelling several hours after the vaccination. She felt pain and could not drop asleep in the evening. Her skin displayed local purple spots the next day. Then, she was treated in the village clinic, but the conditions were not improved. The girl was resulted in hospitalization in Yunyang county hospital after ten days. Her laboratorial testing results as following: red blood cells/erythrocyte count (RBC), 1,220,000/mcL; hemoglobin concentration, 3.5 g/dL; white blood cells/leukocyte count (WBC), 19,500/mcL; platelets/thrombocyte count, 138,000/mcL; bleeding time, 2 min; clotting time, 3 seconds. Her conditions as following: body temperature, 37.5°C; pulse, 120/min; respiration, 28/min; drowsiness, shortness of breath, weak pulse, pale complexion and appearance, sickness; swelling and angioedema in the arm, purple spots of 10 x 10cm in the arm, and systemic purple spots of different size. Other 245 pupils who received the meningococcal vaccine at the school except the girl did not present adverse reactions. According to statement of her parents, administration of other vaccines did not cause adverse reactions before the vaccination. The girl was diagnosed as thrombocytopenia and allergic purpura, and was given the combined treatment of anti-infection, anti-allergy, hemostasis, blood transfusion this day in the county hospital. However, the girl and her parents left the hospital on their own in the next morning because of financial problem. She died on their way to her house in the afternoon, with stiff corpus, closed tightly eyes,

swollen right arm and systemic purple spots of different size.

DISCUSSION

The symptoms of the girl revealed that she had severe adverse reactions after the meningococcal vaccination, which included local and systemic side effects, allergic reactions. However, it was a very rare case in meningococcal vaccination [2, 1, 6]. In particular, the meningococcal vaccine caused thrombocytopenia and allergic purpura, leading to death. The laboratorial testing results shown that the red blood cells count and the platelet count of the girl were lower than the normal RBC ranges (4,700,000-6,100,000/mcL for male, 4,200,000-5,400,000/mcL for female) and the normal platelet range (150,000-400,000/mcL), and her hemoglobin concentration was greatly lower than the normal results of hemoglobin (13.8-17.2g/dL for male, 12.1-15.1g/dL for female). Nevertheless, her white blood cells count was higher than the normal WBC range (4,500-11,000/mcL) [13]. Meanwhile, her clotting time was longer than time of the international normalized ratio (0.8-1.1) [13]. Therefore, she suffered from thrombocytopenia. Clinical evidence shows that if the blood platelet count of one person falls below normal, he or she has thrombocytopenia [14, 15], which is sometimes associated with abnormal bleeding or spontaneous bleeding [16, 13], and can lead to purpura [15]. Thrombocytopenic purpura may be caused by vaccination, which is called Immune or Idiopathic Thrombocytopenic Purpura (ITP), an autoimmune bleeding disorder characterized by the abnormally low levels of blood cells called platelets [17-19]. Most cases of ITP occurred following vaccination with the first dose of measles-containing vaccine [20-23]. However, ITP cases might also happen following other vaccinations, such as diphtheria, pertussis and tetanus vaccine [24], varicella vaccine [25], influenza vaccine [26- 28], hepatitis B vaccine [29, 30, 31], Polio vaccine [32], rabies vaccine [33], pneumococcus vaccine [34]. Moreover, ITP cases following meningococcal vaccines have been reported [35]. The laboratorial testing results and clinical observation revealed that the meningococcal vaccination of the girl in the reported case could induce thrombocytopenic purpura. It has been known that the mainly effective treatment plans for ITP included blood or platelet transfusions [36, 37, 38], and use of medicines, such as corticosteroids, rituximab, eltrombopag, immune globulin, steroids and etc [38-40]. Unfortunately, the girl was only treated with hemostasis and blood transfusion, without appropriate medicines for thrombocytopenia, which affected effect of therapy.

On the other hand, vaccination can also cause allergic purpura [9, 41]. Allergic purpura, or anaphylactoid purpura, or Henoch-Schönlein purpura (HSP), is a type of nonthrombocytopenic purpura [42, 43]. An acute attack of allergic purpura can last for several weeks, but most of patients can recover [43]. Among vaccines, measles-mumps-rubella (MMR) vaccine showed an increased risk of allergic purpura [44]. Meanwhile, hepatitis B and influenza vaccinations could trigger HSP [45- 47]. A case report shows that an 18-month-old male child developed Henoch-Schönlein purpura 7 days after receiving Diphtheria, Pertussis and Tetanus booster vaccine [48]. Usually, allergic purpura affects more males than females and is most prevalent in children ages 3 to 7 [49, 43]. However, two case reports expose that two 17-year-old girls developed Henoch-Schönlein purpura 10 days after respectively receiving a meningococcal vaccine A and C [50, 51]. On the contrary, a study reveals that there was no increase in the relative incidence of HSP within 30 days after meningococcal vaccination [52]. It has been known that acetaminophen or nonsteroidal anti-inflammatory drugs and corticosteroids could be used in treatment for Henoch-Schönlein purpura [53- 55]. Unluckily, the allergic reactions of the girl were not controlled effectively and treated appropriately.

According to analysis of the allergic symptoms (drowsiness, pain, swelling and angioedema in the arm) of the girl, the meningococcal vaccination could trigger allergic purpura. Meanwhile, based on her laboratorial testing results (lower platelets count, higher leukocyte count and longer clotting time), the vaccination could induce thrombocytopenic purpura. Therefore, the meningococcal vaccination could cause both allergic purpura and thrombocytopenic purpura, which led to severe adverse reaction – death, though it was a very rare case. Certainly, other factors could contribute death of the girl.

CONCLUSION

The meningococcal vaccination caused thrombocytopenia and allergic purpura of the girl. Nevertheless, the data in the reported case are insufficient to determine a causal association between the vaccine and its severe side-effect, in particular, leading to death [56]. Therefore, the adverse or allergic reactions after the meningococcal vaccination need to be analyzed and evaluated further [41]. Meanwhile, the safety of meningococcal vaccines should be monitored appropriately and effectively [7, 57, 6]. Moreover, in subjects at high risk, the vaccine can be safely given with precaution, appropriately administering doses, available materials and support for the treatment of side-effects [58].

Competing interests

All of the authors declare that they have no conflict of interests.

Acknowledgement

The authors appreciate support of doctors, nurses and health professionals in Yunyang county hospital and Yunyang Center for Disease Control and Prevention, Chongqing, China.

REFERENCE

1. Centre for Disease Control and Prevention (CDC). Possible Side-effects from Vaccines. 2016a. Access: https://www.cdc.gov/vaccines/vac-gen/side-effects.htm .
2. Centre for Disease Control and Prevention (CDC). Meningococcal Vaccine Safety. 2015. Access: https://www.cdc.gov/vaccinesafety/vaccines/meningococcal-vaccine.html .
3. Department of Health & Human Services (DHHS). Side effects of the meningococcal vaccines. State Government of Victoria, Australia. 2016. Access: https://www.betterhealth.vic.gov.au/health/healthyliving/meningococcal-disease-immunisation .
4. Medical Health (MH). Meningitis Vaccine Side Effects. MDhealth.com. 2017. Access: http://www.md-health.com/Meningitis-Vaccine-Side-Effects.html .
5. Government of Canada (GC). Canadian Immunization Guide: Part 4 - Active Vaccines. 2016. Access: http://healthycanadians.gc.ca/publications/healthy-living-vie-saine/4-canadian-immunization-guide-canadien-immunisation/index-eng.php?page=15 .
6. Centre for Disease Control and Prevention (CDC). Vaccine Information Statement (VISs): Meningococcal ACWY Vaccines (MenACWY and MPSV4) VIS. 2016b. Access: https://www.cdc.gov/vaccines/hcp/vis/vis-statements/mening.html .
7. Ball R, Braun MM, Mootrey GT and Vaccine Adverse Event Reporting System Working Group. Safety Data on Meningococcal Polysaccharide Vaccine from the Vaccine Adverse Event Reporting System. Clin Infect Dis, 2001, 32 (9):1273-1280. Access: http://cid.oxfordjournals.org/content/32/9/1273.full .
8. Centre for Disease Control and Prevention (CDC). Update: Guillain-Barré syndrome among recipients of Menactra meningococcal conjugate vaccine--United States, October 2005-February 2006. MMWR Morb Mortal Wkly Rep, 2006, 55 (13): 364-366. Access: https://www.ncbi.nlm.nih.gov/pubmed/16601664/ .
9. World Health Organization (WHO). Global Vaccine Safety. Menactra meningococcal vaccine and Guillain-Barré syndrome. 2011. Access: http://www.who.int/vaccine_safety/committee/topics/meningococcal/GBS/en/ .
10. Velentgas P, Amato AA, Bohn RL, Chan KA, Chchrane T, Funch DP, et al. Risk of Guillain-Barré syndrome after meningococcal conjugate vaccination. Pharmacoepidemiol Drug Saf, 2012, 21 (12): 1350-1358. Access: https://www.ncbi.nlm.nih.gov/pubmed/22807266 .
11. Souayah N, Nasar A, Suri MF, Qureshi AI. Guillain-Barré syndrome after vaccination in United States: data from the Centers for Disease Control and Prevention/Food and Drug Administration Vaccine Adverse Event Reporting System (1990-2005). J Clin Neuromuscul Dis, 2009, 11 (1) 1-6. Access: https://www.ncbi.nlm.nih.gov/pubmed/19730016 .
12. U.S. National Library of Medicine (USNLM). Meningococcal ACWY Vaccines (MenACWY and MPSV4). Medline Plus. 2016a. Access: https://medlineplus.gov/druginfo/meds/a607020.html .
13. U.S. National Library of Medicine (USNLM). Medical Encyclopedia. MedlinePlus. 2016b. Access: https://medlineplus.gov/ency/article/ .
14. National Heart, Lung, and Blood Institute (NHLBI). What Is Thrombocytopenia? 2012a. Access: https://www.nhlbi.nih.gov/health/health-topics/topics/thcp .
15. Davis CP, Nabili SN, Shiel WC. Thrombocytopenia (Low Platelet Count). MedicineNet.com. 2016. Access: http://www.medicinenet.com/thrombocytopenia_low_platelet_count/article.htm .
16. Communicable Disease Control Unit (CDCU). Adverse Events Following Immunization: Interpretation and Clincal Definitions Guide. Version 1.0. New Brunswick, Canada. 2011. Access: http://www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/en/CDC/HealthProfessionals/AEFIsinterpretationandclinicaldefinitionsguide.pdf .
17. Gauer RL, Braun MM. Thrombocytopenia. Am Fam Physician, 2012, 85 (6): 612-622. Access: http://www.aafp.org/afp/2012/0315/p612.html .
18. National Organization for Rare Disorders (NORD). Immune Thrombocytopenia. 2016. Access: https://rarediseases.org/rare-diseases/immune-thrombocytopenia/ .
19. Stanford Children's Health (SCH). Immune (Idiopathic) Thrombocytopenia Purpura. Stanford University. 2017. Access: http://www.stanfordchildrens.org/en/topic/default?id=immune-idiopathic-thrombocytopenia-purpura-90-P02315 .
20. Rajantie J, Zeller B, Treutiger I, Rosthöj S. NOPHO ITP working group and five national study groups. Vaccination associated thrombocytopenic purpura in children. Vaccine, 2007, 25 (10):1838-1840. Access: https://www.ncbi.nlm.nih.gov/pubmed/17126957 .
21. France EK, Glanz J, Xu S, Hambidge S, Yamasaki K, Black SB, et al. Vaccine Safety Datalink Team. Risk of immune thrombocytopenic purpura after measles-mumps-rubella immunization in children. Pediatrics, 2008, 121 (3): e687-e692. Access: https://www.ncbi.nlm.nih.gov/pubmed/18310189 .
22. Cecinati V, Principi N, Brescia L, Giordano P and Esposito S. Vaccine administration and the development of immune thrombocytopenic purpura in children. Hum Vaccin Immunother, 2013, 9 (5): 1158–1162. Access:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3899154/ .

23. Owatanapanich S, Wanlapakorn N, Tangsiri R and Poovorawan Y. Measles-Mumps-Rubella Vaccination Induced Thrombocytopenia: A Case Report and Review of the Literature. Southeast Asian J Trop Med Public Health, 2014, 45 (5): 1053-1057. Access: http://www.tm.mahidol.ac.th/seameo/2014-45-5/11-62022.pdf .
24. World Health Organization (WHO). Global Vaccine Safety: Information Sheet Observed Rate of Vaccine Reactions: Measles, Mumps and Rubella Vaccine. 2014. Access: http://www.who.int/vaccine_safety/initiative/tools/MMR_vaccine_rates_information_sheet.pdf .
25. BC Centre for Disease Control (BCDC). Communicable Disease Control Immunization Program: Section IX – Adverse Events Following Immunization. 2014. Access: http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%202%20-%20Imms/SectionIX_AdverseEventsFollowingImmunization.pdf .
26. Mantadakis E, Farmaki E, Thomaidis S, Tsalkidis A, Chatzimichael A. A case of immune thrombocytopenic purpura after influenza vaccination: consequence or coincidence? J Pediatr Hematol Oncol, 2010, 32 (6): e227-229. Access: https://www.ncbi.nlm.nih.gov/pubmed/20539239 .
27. Nagasaki J, Manabe M, Ido K, Ichihara H, Aoyama Y, Ohta T, Furukawa Y and Mugitani A. Postinfluenza Vaccination Idiopathic Thrombocytopenic Purpura in Three Elderly Patients. Case Reports in Hematology, 2016, Vol. 2016, Article ID 7913092. Access: https://www.hindawi.com/journals/crihem/2016/7913092/ .
28. Hamiel U, Kventsel I, Youngster I. Recurrent Immune Thrombocytopenia After Influenza Vaccination: A Case Report. Pediatrics, 2016, 138 (6): e20160124. Access: http://pediatrics.aappublications.org/content/138/6/e20160124?sso=1&sso_redirect_count=1&nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token .
29. Ronchi F, Cecchi P, Falcioni F, Marsciani A, Minak G, Muratori G, Tazzari PL, Beverini S. Thrombocytopenic purpura as adverse reaction to recombinant hepatitis B vaccine. Arch Dis Child, 1998, 78: 273-274. Access: http://adc.bmj.com/content/78/3/273.full .
30. Maezono R, de Ulhôa Escobar AM. Thrombocytopenic purpura after hepatitis B vaccine. Jornal de Pediatria, 2000, 76 (5): 395-398. Access: http://www.jped.com.br/conteudo/00-76-05-395/ing.pdf .
31. Nuevo H, Nascimento-Carvalho CM, Athayde-Oliveira CP, Lyra I, Moreira LMO. Thrombocytopenic purpura after hepatitis B vaccine: case report and review of the literature. Pediatric Infectious Disease Journal, 2004, 23 (2): 183-184. Access: http://journals.lww.com/pidj/Citation/2004/02000/Thrombocytopenic_purpura_after_hepatitis_B.23.aspx .
32. Akbayram S, Karaman K, Ece I and Akbayram TH. Acute Immune Thrombocytopenic Purpura Following Oral Polio Vaccination. Platelets, 2015, 26 (7): 705. Access: http://www.tandfonline.com/doi/full/10.3109/09537104.2014.980798 .
33. Fulbright JM, Williams SE, Pahud BA. Case of Immune Thrombocytopenic Purpura After Rabies Vaccination. Journal of Pediatric Hematology Oncology, 2015, 37 (7): e427-e428(2). Access: http://www.unboundmedicine.com/medline/citation/26165405/A_Case_of_Immune_Thrombocytopenic_Purpura_After_Rabies_Vaccination_ .
34. Lee J, Kim HS, Han JW, Lyu CJ. Pneumococcal Sepsis 8 Years after Splenectomy for Chronic Immune Thrombocytopenia: A Case of Vaccinated 12-year-old Patient. Clin Pediatr Hematol Oncol, 2013, 20 (1): 62-65. Access: https://www.koreamed.org/SearchBasic.php?DT=1&RID=2093CPHO%2F2013.20.1.62 .
35. Amirifard H, Barzkar F, Fazeli SA and Hashemi SM. An unusual occurrence of Kleine-Levin syndrome in a man with refractory immune thrombocytopenic purpura: a case report. Journal of Medical Case Reports, 2015, 9:76. Access: https://jmedicalcasereports.biomedcentral.com/articles/10.1186/s13256-015-0536-5 .
36. Provan D, Stasi R, Newland AC, et al. International consensus report on the investigation and management of primary immune thrombocytopenia. Blood, 2010, 115 (2):168–186. Access: http://www.hematologialafe.es/DOCUMENTOS_C/INVESTIGACION/PUBLICACIONES/PUBLICACIONES%202010/PROVAN%20D_INTERNATIONAL%20CONSENSUS%20REPORT%20ON%20THE%20INVESTIGATION.PDF .
37. Neunert C, Lim W, Crowther M, Cohen A, Solberg L Jr. and Crowther MA. The American Society of Hematology 2011 evidence-based practice guideline for immune thrombocytopenia. Blood, 2011, 117 (16):4190–4207. Access: https://pedclerk.bsd.uchicago.edu/sites/pedclerk.uchicago.edu/files/uploads/Blood-2011-Neunert-4190-207(1).pdf .
38. National Heart, Lung and Blood Institute (NHLBI). How Is Thrombocytopenia Treated? 2012b. Access: https://www.nhlbi.nih.gov/health/health-topics/topics/thcp/treatment .
39. Kuter DJ. Immune Thrombocytopenia (ITP). Merck Manual Professional Version. 2016. Access:

http://www.merckmanuals.com/professional/hematology-and-oncology/thrombocytopenia-and-platelet-dysfunction/immune-thrombocytopenia-itp .

40. Children's National Health System (CNHS). Pediatric Idiopathic Thrombocytopenia Purpura (ITP). 2017. Access: http://childrensnational.org/choose-childrens/conditions-and-treatments/blood-marrow/idiopathic-thrombocytopenia-purpura-itp .
41. Vernon N, Jhaveri P. Adverse Effects of Adolescent Immunizations. The Journal of the American Osteopathic Association, 2014, 114: S13-S17. Access: http://jaoa.org/article.aspx?articleid=2094585 .
42. McCann JAS, Holems HN, Robinson JM, Kasmer E, Brownell CL, Houska AE, Webb S, Tscheschlog BA. Professional Guide to Disease. Lippincott Williams & Wilkins. The Ninth Edition. 2009. Page 523. Access: https://books.google.ca/books?id=1h6vu60L6FcC&pg=PA523&lpg=PA523&dq=allergic+purpura&source=bl&ots=jCD9_iIimu&sig=PkOisvWxEwHb4b8sa7c_0sgl2S0&hl=fr&sa=X&ved=0ahUKEwi7lYmXqqfRAhVn4oMKHUv0B8Y4FBDoAQgyMAM#v=onepage&q=allergic%20purpura&f=false .
43. Family Medicine Help (FMH). Introduction to Allergic purpura. 2013. Access: http://familymedicinehelp.com/introduction-to-allergic-purpura .
44. Dalt LD, Zerbinati C, Strafella MS, Renna S, Ricetupi L, Pietro PD, et al. Henoch-Schönlein purpura and drug and vaccine use in childhood: A case-control study. Italian Journal of Pediatrics, 2016, 42: 60. Access: https://www.researchgate.net/publication/304070583_Henoch-Schonlein_purpura_and_drug_and_vaccine_use_in_childhood_A_case-control_study .
45. Perkins M, Love K, Lazarus A. Henoch-Schönlein Purpura with Diffuse Alveolar Hemorrhage Following Hepatitis B Vaccination Free to View. CHEST journal, 2008, 134: 4. Access: http://journal.publications.chestnet.org/article.aspx?articleid=1094367 .
46. Watanabe T. Henoch-Schonlein purpura following influenza vaccinations during the pandemic of influenza A (H1N1). Pediatric Nephrology, 2010, 26 (5): 795-8. Access: https://www.ncbi.nlm.nih.gov/pubmed/21120537?access_num=21120537&link_type=MED&dopt=Abstract ; https://www.researchgate.net/publication/49647895_Henoch-Schonlein_purpura_following_influenza_vaccinations_during_the_pandemic_of_influenza_A_H1N1 .
47. McNally A, McGregor D, Searle M, Irvine J and Cross N. Henoch–Schönlein purpura in a renal transplant recipient with prior IgA nephropathy following influenza vaccination. Clin Kidney J, 2013, 6 (3): 313–315. Access: http://pubmedcentralcanada.ca/pmcc/articles/PMC4400476/ .
48. Nair BT, Krishna SR, Karmani S. Leukocytoclastic vasculitis following DPT vaccination. Trop J Med Res, 2015,18: 42-44. Access: http://www.tjmrjournal.org/article.asp?issn=1119-0388;year=2015;volume=18;issue=1;spage=42;epage=44;aulast=Nair .
49. Kraft DM, Mckree D and Scott C. Henoch-Schönlein Purpura: A Review. Am Fam Physician, 1998, 58 (2): 405-408. Access: http://www.aafp.org/afp/1998/0801/p405.html .
50. Courtney PA, Patterson RN and Lee RJE. Henoch–Schönlein purpura following meningitis C vaccination. Rheumatology, 2001, 40 (3): 345-346. Access: http://rheumatology.oxfordjournals.org/content/40/3/345.full .
51. Lambert EM, Liebling A, Glusac E, Antaya RJ. Henoch-Schönlein Purpura Following a Meningococcal Vaccine. Pediatrics, 2003, 112 (6): e491-e494. Access: http://pediatrics.aappublications.org/content/112/6/e491 .
52. Sexton K, McNicholas A, Galloway Y, Radke S, Kieft C, Stehr-Green P, Reid S, Neutze J, Drake R. Henoch-Schönlein Purpura and meningococcal B vaccination. Arch Dis Child, 2007, doi:10.1136/adc.125195. Access: http://adc.bmj.com/content/early/2008/07/23/adc.2007.125195.abstract .
53. Meiller MJL, Cavallasca JA, Maliandi MR, Guillermo G. Henoch-SchöNlein Purpura in Adults. Clinics, 2008, 63 (2): 273–276. Access: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2664214/ .
54. Reamy BV, Williams PM, Lindsay TJ. Henoch-Schönlein Purpura. Am Fam Physician, 2009, 80 (7): 697-704. Access: http://www.aafp.org/afp/2009/1001/p697.html .
55. Samala A. Henoch-Schönlein Purpura. Vasculitis Organization, UK. 2016. Access: http://www.vasculitis.org.uk/about-vasculitis/henoch-schonlein-purpura .
56. Pless RP, Bentsi-Enchill AD and Dudos P. Monitoring Vaccine Safety during Measles Mass Immunization Campaigns: Clinical and Programmatic Issues. Journal of Infectious Disease, 2003, 187 (Supplement 1): S291-S298. Access: http://jid.oxfordjournals.org/content/187/Supplement_1/S291.full .
57. Franceschini F, Bottau P, Caimmi S, Crisafulli G, Lucia L, Peroni D, Saretta F, Vernich M, Dascola CP and Caffareli C. Vaccination in children with allergy to non active vaccine components. Clin Transl Med, 2015, 4: 3. Access: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4384976/