

Research and Reviews: Journal of Pharmaceutical Quality Assurance

Blood and its Complications

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Review Article

Received: 08/08/2016

Accepted: 12/08/2016

Published: 19/08/2016

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Keywords: Blood, Metabolism,
Blood pressure, Blood disorders

ABSTRACT

In Medical terms blood mean hemo- or hemato- (haemo- and haemato-). Blood is an animal body fluid which function as a delivery boy. It delivers important substances such as nutrients, minerals, oxygen to the cells and metabolic waste products away from those same cells so called as the carriers of the body. Blood is a specialized form of connective tissue seen in the bones and presence of potential fibers called as fibrinogen.

INTRODUCTION

It constitutes of blood cells in blood plasma. Half of the blood fluid consists of water (92% /v), dissolved proteins, glucose, mineral ions, hormones, carbon dioxide. It is the main medium for excretory product, plasma and blood cells. The main plasma protein to regulate the blood colloidal osmotic pressure is Albumin. The blood cells are mainly red blood cells (erythrocytes), white blood cells (Leukocytes), and platelets (Thrombocytes). The majority of cells in vertebrate blood are red blood cells. These contain an iron protein called hemoglobin, which helps in oxygen transport by binding reverse to increase its solubility. Carbon dioxide (CO₂) is transported extracellularly in the form of bicarbonate ion (HCO₃⁻) [1-20].

Blood is bright red in colour called oxygenated and dark red called deoxygenated. Animals like crustaceans and mollusks have hemocyanin to carry oxygen replacing hemoglobin. Insects and some mollusks also have hemolymph. This does not mean that hemolymph is not a closed circulatory system. Insect blood does not contain oxygen-carrying molecules as their body is very small for oxygen supply [21-30].

Vertebrates have an adaptive immune system because of white blood cells. White blood cells are the killing factors of Bacterial and parasitic infections. The main and important blood clotting factor is platelets. Arthropods such as cockroaches use hemolymph and hemocytes as major part of their immune system [31-41].

Blood circulation all over the body is through blood vessels by heart pumping. Blood vessels are of two types Arteries and Veins. Arteries carry oxygen from inhaled air to the tissues and veins carries carbon dioxide from tissues to the lungs.

Blood is a constant circulating substance in the body. It contains numerous cells and proteins hence making it thicker than pure water. The average person has about 4-5 liters of blood. Half of the blood content is called as plasma. Plasma contains some factors that help in blood clotting which is an important and helpful function at the time of accidents. Blood plasma contains glucose and dissolved nutrients. There are rare complications in blood transfusion but very fatal to life [41-50].

BLOOD COMPLICATIONS OR DISORDERS

Hemorrhage (bleeding)

Blood leaking out of blood vessels during accidents. Internal bleeding (into intestines) may not be immediately apparent. Their affect will be in the future ^[51-60].

Leukemia

A type of blood cancer in which rapid multiplication of white blood cells. The excessive large numbers of white cells in the body cause severe damage to the organs.

Multiple myeloma

A type of cancer similar to leukemia. Anemia and kidney failure are the common symptoms found in multiple myeloma.

Lymphoma

A form of blood cancer in which abnormal multiplication of WBC's takes place inside the lymph nodes and other tissues. Inflammation of tissues and disruption of blood functions will eventually cause organ failure ^[61-70].

Anemia

It is an abnormal blood condition with low RBC count which results in fatigue and breathlessness. There are no noticeable symptoms for anemia.

Hemolytic anemia

Anemia caused by rapid bursting of large numbers of RBC's. An immune system malfunction is one cause.

Hemochromatosis

A disorder causing excessive levels of iron in the blood. The iron deposits in the liver, pancreas and other organs, causing liver problems and diabetes ^[71-80].

Sickle cell disease

A genetic condition of red blood cells in which it loses their proper shape (appearing like sickles, rather than discs). The deformed blood cells accumulated in tissues, causing pain and organ damage.

Bacteremia

Bacterial flow in blood is called as bacteremia. Blood infections are serious, and often require hospitalization and continuous antibiotic treatment into the veins.

Malaria

Infection of red blood cells by Plasmodium, a parasite transmitted by mosquitos. Malaria causes episodic fevers, chills, and potentially organ damage ^[81-90].

Thrombocytopenia

Abnormal low number of platelets in the blood. Severe thrombocytopenia leads bleeding into the tissues and late blood clotting.

Leukopenia

Abnormal low numbers of white blood cells in the blood called as leukopenia. Leukopenia results in difficulty in fighting infections. A person suffering from Leukopenia will invite all the opportunistic infections due to low immunity.

Hemophilia

A genetic deficiency having low blood clotting proteins factors and blood plasma. Frequent or uncontrolled bleeding can result hemophilia and can be a cause for permanently debilitating and death.

Polycythemia

Abnormal increase in the number of red blood cells in the blood. It is a result due to low levels of blood oxygen which may lead to cancer.

Myocardial infarction (MI)

Commonly called as heart attack or cardiac arrest. Myocardial infarction occurs due to a sudden clot in one of the arteries which supply blood to the heart. It can be any artery in any part of the heart ^[91-106].

CONCLUSION

Blood disorders leads from deficiency of coagulation factors. These often effect the life style of the common person leading to severe complications which may be curable or in curable. Many advanced studies should be implemented or invented to fight against these and try to completely eradicate all over the world.

REFERENCES

1. Ching NG, Tsui DK, Yau KK and Tang CN (2013) A Man with Breast Cancer Following Hormonal Treatment for Prostate Cancer J Med Diagn Meth 2: 112.
2. Iacono F, Prezioso D, Ruffo A, Di Lauro G, Illiano E, et al. (2013) Treating Idiopathic Male Infertility with a Combination of Tamoxifen Citrate and a Natural Compost with Antioxidant and Androgen-Mimetic Action. J Steroids Hormon Sci S5: 002.
3. Shaaban MM, Ahmed WS, Keshk I, Bahaie HE (2012) Follicular Fluid Activin A and Leptin are not Correlated with IVF Outcome Measures. J Steroids Horm Sci 4: 111.
4. Santos FGDL, El-Dandachli AE, Buggs-Saxton C (2014) Regulation of Glucose Transporter 1 (Slc2a1) in the Pituitary Gonadotrope of Mice after Puberty. J Steroids Hormon Sci 5: 138.
5. Declercq J, Creemers JW (2012) Replenishing a Balanced Mixture of Hormone Producing Cells: A Necessary Component in the Stem Cell Based Therapy for Diabetes? J Steroids Horm Sci 3: e111.
6. Wojcik M, Janus D, Poplawska K, Tyrawa K, Zygmunt-Gorska A, et al. (2013) High Incidence of Abnormal Circadian Blood Pressure Profiles in Patients on Steroid Replacement Therapy due to Secondary Adrenal Insufficiency and Congenital Adrenal Hyperplasia without Overt Hypertension - Initial Results. J Steroids Hormon Sci S12: 005.
7. Neves EM, Fonseca AM, Bagnoli VR, Souza MA, Araujo Moraes SDT, et al. (2014) Polycystic Ovary Syndrome: Correlation between Phenotypes and Metabolic Syndrome. J Steroids Hormon Sci 5: 132.
8. McGrath KCY, Li XH, Gaus K, Williams P, Celermajer DS et al. (2012) Androgens Rapidly Activate Nuclear Factor-Kappa B via Intracellular Ca²⁺ Signalling in Human Vascular Endothelial Cells. J Steroids Hormon Sci S2: 005.
9. Bandaru P, Rajkumar H, Nappanveetil G (2013) The Impact of Obesity on Immune Response to Infection and Vaccine: An Insight into Plausible Mechanisms. Endocrinol Metab Syndr 2:113.
10. Genazzani AD, Despini G, Santagni S, Prati A, Rattighieri E, et al. (2014) Effects of a Combination of Alpha Lipoic Acid and Myo-Inositol on Insulin Dynamics in Overweight/Obese Patients with PCOS. Endocrinol Metab Syndr 3:140.
11. Mohamed WS, Hassanien MA, Sayed Abokhosheim KEL (2014) Role of Ghrelin, Leptin and Insulin Resistance in Development of Metabolic Syndrome in Obese Patients. Endocrinol Metab Syndr 3:122.
12. Pramanik KC, Pandey AK (2013) Natural Compounds: Prospective of Chemoprevention. Endocrinol Metab Syndr 2:e115.
13. Nakaoka K, Branch J, Yamaguchi M, Ozeki T, Hazi Y, et al. (2012) A Case of Primary Adrenal Tuberculosis - A Diagnostic Quandary. Endocrinol Metabol Syndrome 1:103.
14. Chakraborty PP, Chowdhury S (2015) A Look Inside the Pancreas: The "Endocrine-Exocrine Cross-talk". Endocrinol Metab Syndr 4:160.
15. Shpakov AO (2013) GPCR-Peptides: Prospective Use in Biology and Medicine. Endocrinol Metab Syndr 2:e116.

16. Harinarayan CV, Appicatlaa L, Nalini BA, Joshi S, et al. (2012) Efficacy and Safety of Cholecalciferol Supplementation in Vitamin D Deficient Subjects Based on Endocrine Society Clinical Practice Guidelines. *Endocrinol Metabol Syndrome* S4:004.
17. Stoll H, Hamel FG, Lee JS, Ha L, Lim JY (2015) Mechanical Control of Mesenchymal Stem Cell Adipogenesis. *Endocrinol Metab Synd* 4:152.
18. Horita S, Seki G, Yamada H, Suzuki M, Nakamura M, et al. (2011) Metabolic syndrome and insulin signaling in kidney. *Endocrinol Metabol Syndrome* S1:005.
19. Pirasath S (2015) Glycemic Index of Traditional Foods in Northern Sri Lanka. *Endocrinol Metab Synd* 4:154.
20. Bohra A, Bhateja S (2015) Carcinogenesis and Sex Hormones: A Review. *Endocrinol Metab Synd* 4:156.
21. Peppia M, Koliaki C, Dimitriadis G (2012) Body Composition as an Important Determinant of Metabolic Syndrome in Postmenopausal Women. *Endocrinol Metabol Syndrome* S1:009.
22. de Piano A, Estadella D, Oyama LM, Ribeiro EB, D'Almaso AR, et al. (2014) Nonalcoholic Fatty Liver Disease (NAFLD), a Manifestation of the Metabolic Syndrome: New Perspectives on the Nutritional Therapy. *Endocrinol Metab Synd* 3:135.
23. Guénard F, Cormier M, Tchernof A, Deshaies Y, Biron S, et al. (2014) Common Sequence Variants in CD163 Gene are Associated with Plasma Triglyceride and Total Cholesterol Levels in Severely Obese Individuals. *Endocrinol Metab Synd* 3:146.
24. Granados H, Phulwani P (2013) Absent Visualization of a Hypoplastic Uterus in a 16 Year Old with Complete 46 XY Gonadal Dysgenesis (Swyer Syndrome). *Endocrinol Metab Synd* 2:114.
25. Aina O (2013) Adrenal Psychosis, A Diagnostic Challenge. *Endocrinol Metab Synd* 2:115.
26. Mohammed SA (2015) Differentiation between the Anterior Pituitary Cells of the Egyptian Insectivorous Bats *Rhinopoma hardwickei* using Transmission Electron Microscope. *Endocrinol Metab Synd* 4:151.
27. Burini RC, Torezan GA, Sloan LA, Corrente JE, McLellan KCP (2014) Dietary Intake Association with IFG and Responses of a Lifestyle Changing Protocol in a Community-B based Adult Cohort. *Endocrinol Metab Synd* 3:125.
28. Derar DR, Hasab-Enaby HS, Ali HH, Zain A, Shehata SH (2011) Postpartum Ovarian Resumption in Native Dairy Cows in Upper Egypt and their Relation to Oxidant Antioxidant Status. *Endocrinol Metabol Syndrome* S4:002.
29. Ekmekci A, Gungor B, Uluganyan M, Ozcan KS, Bozbay M, et al. (2013) Presence of Metabolic Syndrome is not an Independent Predictor of In-hospital Adverse Events in Patients with ST Elevation Myocardial Infarction that Underwent Primary Percutaneous Coronary Intervention. *Endocrinol Metab Synd* 2:112.
30. Hossein-nezhad A, Mirzaei K, Alatab S, Ahmadvand Z, Najmafshar A (2012) Circulating Omentin-1 in Obesity and Metabolic Syndrome Status Compared to Control Subjects. *Endocrinol Metabol Syndrome* S1:008
31. Levine J, Lu Y, Carreon CK, Edelman M (2015) Proton-Pump Inhibitor Treatment in Eosinophilic Esophagitis is Associated with Decreased Eosinophil Degranulation. *J Gastrointest Dig Syst* 5:259
32. Abegunde A, Sawh RN, Vega KJ (2015) Change in Bowel Habit and Heme Positive Stool. *J Gastrointest Dig Syst* 5:i104.
33. Hopp RN, Lima NCDS, Filho MS, Filho JLF, Jorge J (2015) Digit Ratio is Associated with Colorectal Cancer. *J Gastrointest Dig Syst* 5:253.

34. Taboada S, Whitney-Miller CL (2013) Updates in HER2 Testing in Gastric Cancer. *J Gastroint Dig Syst* 3:131.
35. Tasar PT, Ozdemir O, Binicier O, Topalak OS (2014) Hemosiderosis due to Chronic Alcoholism. *J Gastroint Dig Syst* 4:182.
36. Bergholt MS, Zheng W, Ho KY, Yeoh KG, Huang Z (2013) Raman Endoscopy for Objective Diagnosis of Early Cancer in the Gastrointestinal System. *J Gastroint Dig Syst* S1:008.
37. Protic MB, Seibold FW, Weimann R (2014) An Unusual Cause of Gastrointestinal Bleeding: Gastric Fundic Gland Polyps. *J Gastroint Dig Syst* 4:203
38. Patil R, Khoosal S, Cassidy L, Ona M (2013) Characteristics and Risk Stratification of Colon Polyps among Asymptomatic Hispanic Patients Undergoing First Time Screening Colonoscopy: A Retrospective Study. *J Gastroint Dig Syst* 3:153.
39. Trabulo D, Teixeira C, Ribeiro S, Martins C, Mangualde J, et al. (2015) Sweet Syndrome and Pulmonary Tuberculosis in a Crohn's Disease Patient Treated with Anti-TNF α . *J Gastrointest Dig Syst* 5:262.
40. Bertino G, Demma S, Bertino N, Ardiri A (2014) Management of Hepatocellular Carcinoma: An Update at the Start of 2014. *J Gastroint Dig Syst* 4:178.
41. Acar S (2015) Plantar Erythema Nodosum Associated with Crohn's Disease. *J Gastrointest Dig Syst* 5:i102.
42. Yildirim AE, Ocal S, Ocal R, Altun R, Korkmaz M, et al. (2015) An Unexpected Cause of Hyperactive Delirium in Patients with Decompensated Nonalcoholic Cirrhosis. *J Gastrointest Dig Syst* 5:261.
43. Rino Y, Yukawa N (2013) Vitamin A, D, and E after Gastrectomy for Gastric Cancer. *J Gastroint Dig Syst* S12:009.
44. Ebert EC (2011) Gastrointestinal Manifestations of Churg-Strauss Syndrome. *J Gastrointest Dig Syst* 1:101.
45. Shi D, Qiu Xm, Feng Ty (2013) Current Status of Metal Stents for Malignant Gastro-Duodenal Obstruction. *J Gastroint Dig Syst* 3:140.
46. Salem A, Roland BC (2014) Small Intestinal Bacterial Overgrowth (SIBO). *J Gastroint Dig Syst* 4:225.
47. Oldfield EC, Dong RZ, Johnson DA (2014) Nonalcoholic Fatty Liver Disease and the Gut Microbiota: Exploring the Connection. *J Gastrointest Dig Syst* 4:245.
48. Nerome K, Kuroda K, Sugita S, Kawasaki K, Iinuma H, et al. (2015) The Usefulness of an Influenza Virus-Like Particle (VLP) Vaccine Produced in Silkworm Pupae and Virosomes and Liposomes Prepared by Chemical Means: From Virosome to VLP and the Future of Vaccines. *J Gastrointest Dig Syst* 5:256.
49. Liang J, Church JM (2015) Standards for Local Recurrence Rates in Both Open and Laparoscopic Rectal Cancer Surgery. How do you Measure Up?. *J Gastrointest Dig Syst* 5:260.
50. Mani P, Neelesh M, Sourabh K, Gaurav M (2015) Treatment and Replenishment of G.I. Tract with Combined Regimen Therapy (CRT) of Allopathic (PPIs) and Ayurvedic (Aloe Vera) Medicine in Peptic Ulcer Disease to Counteract Relapse. *J Gastrointest Dig Syst* 5:272.
51. Huar KJ, Yip CC, Christopher KJL, Damien TMY (2015) Biliary Papillomatosis - A Rare Cause of Recurrent Cholangitis and Biliary Obstruction. *J Gastrointest Dig Syst* 5:1103.
52. Conroy M, Dolan J (2014) Granulomatous Disease with Hepatic and Splenic Infiltration: A Case Report. *J Gastroint Dig Syst* 4:210.
53. Huynh D, Nguyen NQ (2015) Gastrointestinal Dysfunction in Chronic Liver Disease. *J Gastrointest Dig Syst* 5:257.

54. Seleem MI, Hassany M, Shafey HEE, Abdelwahed MS (2013) Role of Laparoscopy in Changing the Management of Hepatocellular Carcinoma. *J Gastroint Dig Syst* 3:147.
55. Wang QL, Tang LX, Deng SM, Tang YG, Zheng LX (2014) Increased Oxidative DNA Damage in Seminal Plasma of Infertile Men with Varicocele. *Andrology* 3:119.
56. Peletiri IC, Ale ST, Peletiri DC (2014) Upgrading the Diagnostic Value of Seminal Analysis Using Sperm Quality Analyzer Visual (SQA-V) Protocol for Clients Associated with Infertility; the Federal Capital Territory, Nigeria Experience. *Andrology* 3:120.
57. Kouka S, Diallo Y, Niang L, Diop Ak, Sylla C (2014) Gangrene of the Penis due to Strangulation by a Metallic Ring: A Case Report. *Andrology* 3:121.
58. Sukhotnik I, Rofe A (2014) Germ Cell Apoptosis: Clinical Implications. *Andrology* 3:122.
59. Paulis G, Farina FP, Cavallini G, De Giorgio G, Barletta D, et al. (2014) Pentoxifylline Associated with Other Antioxidants (Multimodal Therapy) on Patients with Peyronie's Disease. Results of a Controlled Study. *Andrology* 3:123.
60. Soliman AT, De Sanctis V, Yassin M (2014) Androgen Therapy in Adolescents: A Review. *Andrology* 3:124.
61. Peters U, Askling J, Gridley G, Ekblom A, Linet M (2003) Causes of death in patients with celiac disease in a population-based Swedish cohort. *Arch Intern Med* 163: 1566-1572.
62. Culliford A, Markowitz D, Rotterdam H, Green PH (2004) Scalping of duodenal mucosa in Crohn's disease. *Inflamm Bowel Dis* 10: 270-273.
63. Di Tola M, Sabbatella L, Anania MC, Viscido A, Caprilli R, et al. (2004) Anti-tissue transglutaminase antibodies in inflammatory bowel disease: new evidence. *Clin Chem Lab Med* 42: 1092-1097.
64. Barta Z, Csipo I, Szabo GG, Szegedi G (2003) Seroreactivity against *Saccharomyces cerevisiae* in patients with Crohn's disease and celiac disease. *World J Gastroenterol* 9: 2308-2312.
65. Tursi A, Giorgetti GM, Brandimarte G, Elisei W (2005) High prevalence of celiac disease among patients affected by Crohn's disease. *Inflamm Bowel Dis* 11: 662-666.
66. Bardella MT, Elli L, De Matteis S, Floriani I, Torri V, et al. (2009) Autoimmune disorders in patients affected by celiac sprue and inflammatory bowel disease. *Ann Med* 41: 139-143.
67. Millner PD, Olenchock SA, Epstein E (1994) Bioaerosols associated with composting facilities. *Compost Science & Utilization* 2: 6-57.
68. Lin SJ, Schranz J, Teutsch SM (2001) Aspergillosis case-fatality rate: systematic review of the literature. *Clin Infect Dis* 32: 358-366.
69. Montoya JG, Chaparro SV, Celis D, Cortés JA, Leung AN, et al. (2003) Invasive aspergillosis in the setting of cardiac transplantation. *Clin Infect Dis* 37: S281-S292.
70. Latge JP (1999) *Aspergillus fumigatus* and aspergillosis. *Clin Microbiol Rev* 12: 310-350.
71. Alexander J, Limaye AP, Ko CW, Bronner MP, Kowdley KV (2006) Association of hepatic iron overload with invasive fungal infection in liver transplant recipients. *Liver Transpl* 12: 1799-1804.
72. Altes A, Remach AF, Sarda P, Sancho FJ, Sureda A, et al. (2004) Frequent severe liver iron overload after stem cell transplantation and its possible association with invasive aspergillosis. *Bone Marrow Transplant* 34: 505-509.
73. Iglesias-Osma C, Gonzalez-Villaron L, San Miguel JF, Caballero MD, Vazquez L, et al. (1995) Iron metabolism and fungal infections in patients with haematological malignancies. *J Clin Pathol* 48: 223-225.
74. Cohen MS, Isturiz RE, Malech HL, Root RK, Wilfert CM, et al. (1981) Fungal infection in chronic granulomatous disease. The importance of the phagocyte in defense against fungi. *Am J Med* 71: 59-66.
75. Zaoutis TE, Heydon K, Chu J, Walsh TJ, Steinbach WJ (2006) Epidemiology, outcomes, and costs of invasive aspergillosis in immunocompromised children in the United States.

- Pediatrics 117: e711-e716.
76. Forman SR, Fink JN, Moore VL, Wang J, Patterson R (1978) Humoral and cellular immune responses in *Aspergillus fumigatus* pulmonary disease. *J Allergy Clin Immunol* 62: 131-136.
 77. Madan T, Kishore U, Singh M, Strong P, Hussain EM, et al. (2001) Protective role of lung surfactant protein D in a murine model of invasive pulmonary aspergillosis. *Infect Immun* 69: 2728-2731.
 78. Kradin RL, Mark EJ (2008) The pathology of pulmonary disorders due to *Aspergillus* spp. *Arch Pathol Lab Med* 132: 606-614.
 79. Arvanitis M, Anagnostou T, Fuchs BB, Caliendo AM, Mylonakis E (2014) Molecular and nonmolecular diagnostic methods for invasive fungal infections. *Clin Microbiol Rev* 27: 490-526.
 80. Herbrecht R, Denning DW, Patterson TF, Bennett JE, Greene RE, et al. (2002) Voriconazole versus amphotericin B for primary therapy of invasive aspergillosis. *N Engl J Med* 347: 408-415.
 81. Maertens J, Raad I, Petrikos G, Boogaerts M, Selleslag D, et al. (2004) Efficacy and safety of caspofungin for treatment of invasive aspergillosis in patients refractory to or intolerant of conventional antifungal therapy. *Clin Infect Dis* 39: 1563-1571.
 82. Kontoyannis DP, Hachem R, Lewis RE, Rivero GA, Torres HA, et al. (2003) Efficacy and toxicity of caspofungin in combination with liposomal amphotericin B as primary or salvage treatment of invasive aspergillosis in patients with hematologic malignancies. *Cancer* 98: 292-299.
 83. Deen J, Seidlein LV, Anderson F, Elle N, White JW, et al. (2012) Community-acquired bacterial blood stream infections in developing countries in south and southeast Asia: a systematic review. *Lancet Inf Dis* 12: 480-487.
 84. Latif S, Anwar MS, Ahmad I (2009) Bacterial pathogens responsible for blood stream infections (bsi) and pattern of drug resistance in a tertiary care hospital of Lahore. *Biomedica* 25: 101-105.
 85. Gonsalves WI, Cornish N, Moore M, Chen A, Varman M (2009) Effects of volume and site of blood drawn on blood cultures results. *J Clin Microbiol* 47: 3482-3485.
 86. Podda A, Saul A, Arora R, Bhutta Z, Sinha A, et al. (2010) Conjugate vaccines for enteric fever: proceedings of a meeting organized in new Delhi, India in 2009. *J Infect Dev Ctries* 4: 404-411.
 87. Sigauque B, Roca A, Mandomando I, Morais L, Quinto L, et al. (2009) Community-acquired bacteremia among children admitted to a rural hospital in Mozambique. *Pediatr Infect Dis J* 28: 108-113.
 88. Blomberg B, Manji KP, Urassa WK, Tamim BS, Mwakagile DS, et al. (2007) Antimicrobial resistance predicts death in Tanzanian children with bloodstream infections: a prospective cohort study. *BMJ Infect Dis* 7: 43.
 89. Claudias I, Barray LJ (2010) Pediatric emergencies associated with fever. *Emerg Med Clin North Am* 28: 67-84.
 90. Wilson M, Mitchell M, Morris AJ, Murray PR, Reimer LG, et al. (2007) Principles and procedures for blood cultures: approved guideline. *Clinical and laboratory standards institute* 27.
 91. Zhou L, Pollard AJ (2010) A fast and highly sensitive blood culture PCR method for clinical detection of salmonella enteric serovar typhi. *Ann Clin Microbiol Antimicrob* 9: 14.
 92. Mintegi S, Benito J, Sanchez J, Azkunaga B, Iturralde I, et al. (2009) Predictors of occult bacteremia in young febrile children in the era of the heptavalent pneumococcal conjugate vaccine. *Eur J Emerg Med* 16: 199-205.
 93. Wilkinson M, Bulloch B, Smith M (2009) Prevalence of occult bacteremia in children aged 3 to 36 months presenting to the emergency department with fever in the post-pneumococcal conjugate vaccine era. *Acad Emerg Med* 16: 220-225.
 94. Brauner M, Goldman M, Kozer E (2010) Extreme leukocytosis and the risk of serious bacterial infections in febrile children. *Arch Dis Child* 95: 209-212.
 95. Huppler AR, Eickhoff JC, Wald ER (2010) Performance of low-risk criteria in the evaluation

- of young infants with fever: a review of the literature. *Pediatrics* 125: 228-233.
96. Herz AM, Greenhow TL, Alcantara J, Hansen J, Baxter RP, et al. (2006) Changing epidemiology of outpatient bacteremia in 3- to 36-month-old children after the introduction of the heptavalent conjugated pneumococcal vaccine. *Pediatr Infect Dis J* 25: 293-300.
 97. Whitney CG, Farley M, Hadler J, Harrison LH, Bennett NM, et al. (2003) Decline in invasive pneumococcal disease after the introduction of protein-polysaccharide conjugate vaccine. *N Engl J Med* 348: 1737-1746.
 98. (1989) Anonymous Alcohol drinking. International Agency for Research on Cancer (IARC) Monograph on Evaluation of Carcinogenic Risks of Chemicals to Humans. IARC, Lyon, France 41: 1-416.
 99. Pindborg JJ, Mehta FS, Gupta PC, Daftary DK, Smith CJ (1971) Reverse smoking in Andhra Pradesh, India: A study of palatal lesions among 10169 villagers. *Br J Cancer* 25: 10-20.
 100. Reddy CR (1974) Carcinoma of hard palate in India in relation to reverse smoking of chuttas. *J Natl Cancer Inst* 53: 615-619.
 101. Gavarasana S, Susarla MD (1989) Palatal mucosal changes among reverse smokers in an Indian village. *Jpn J Cancer Res* 80: 209-211.
 102. van Der Eb MM, Leyten EMS, Gavarasana S, Vandembroucke JP, Kahn PM, et al. (1993) Reverse smoking as a risk factor for palatal cancer: A cross-sectional study in rural Andhra Pradesh, India. *Int J Cancer* 54: 754-758.
 103. Ramulu C, Raju MV, Venkatarathnam G, Reddy CR (1973) Nicotine stomatitis and its relation to carcinoma in reverse smokers of chuttas. *J Dent Res* 52: 711-718.
 104. Quigley LF, Cobb CM, Hunt EE Jr (1965) Measurement of oral and burning zone temperature during conventional and reverse smoking. *Arch Oral Biol* 10: 35-44.
 105. Rizzolo D, Chiodo TA (2008) Lesion on the hard palate. *J Fam Pract* 57: 33-35.
 106. Petti S, Scully C (2005) Oral cancer: the association between nation-based alcohol-drinking profiles and oral cancer mortality. *Oral Oncol* 41: 828-834.