

Bölüm 36

GEBELİK VE AKCİĞER HASTALIKLARI

Feyza Nur İNCESU ÇİNTESUN

GİRİŞ

Gebelikte solunum yolu hastalıkları gebeliğin en yaygın medikal komplikasyonları arasında yer almaktadır. Bu hastalıkların gelişimi gebelik sürecinde hem anne hem fetus için artmış morbidite ve mortalite ile sonuçlanabilir. Gebelikte artmış progesterona bağlı solunum sisteminde bir takım değişiklikler olur. Bunları kısaca özetleyecek olursak (1);

- Dakikada solunum sayısının artmasına bağlı olarak tidal volümde %40 artma
- Dakikada ventile edilen havanın yaklaşık %40 artmasıyla (hiperventilasyon) PO_2 'de artış
- Oksijen tüketiminde %15-30 artış
- CO_2 üretiminde artışa rağmen alveolar hiperventilasyon ve difüzyon kapasitesinin artışı ile PCO_2 'de azalma sonucu respiratuar alkalozu kompansatuvar olarak böbrekten bikarbonat atılımında artış nedeniyle arterial pH'da hafif alkalik yükselme (Ph:7.54)
- Diyaframın 4 cm yükselmesiyle fonksiyonel rezidüel volümde %10-25 azalma

Bunlara ek olarak; gebelikte gelişmekte olan fetusu annenin bağışıklık sisteminden koruma amaçlı hücrel immünitinin artışı enfeksiyon geçirme risk ve şiddetini arttırmaktadır (2). Ayrıca progesteron kaynaklı hiperventilasyona bağlı gebelerin %60'nda -hastalar tarafından hava açlığı olarak da tarif edilen-dispne görülmektedir. Bu semptom sıklıkla birinci trimesterde başlayıp,

ikinci trimesterde artıp son trimesterde sabit kalmaktadır (3). Dispne ile gelen bir hastada gebeliğin fizyolojik dispnesi ile ayırıcı tanıda altta yatan solunumsal (astım, enfeksiyon, pulmoner emboli), kardiyak (pulmoner ödem, aritmi, kardiyomyopati) veya metabolik (anemi, diabetik ketoasidoz, zehirlenme) problemler düşünülmelidir (1). Gebelikte dispne fizyolojik de olsa takipne fizyolojik bir durum değildir. Ayrıca fonksiyonel rezidüel kapasitenin azalması ve oksijen tüketiminin artmasına bağlı olarak gebelerin asidozu tolere etme kapasitesi düşmekte böylece apneik bir gebenin hipoksiye ve asidoza girmesi kolaylaşmaktadır (1).

Gebelikte solunum fonksiyonlarını değerlendiren tanı yöntemlerinin ve tedavide kullanılan ilaçların çoğunun fetus üzerinde zararsız olduğu ve gerekli hallerde kullanılmaması gerektiğini bilmek önemlidir. Birkaç istisna dışında, gebelikte solunum yolu hastalıklarına yaklaşım gebe olmayan kadınlarla benzerdir. Bu bölümde gebelikte sık görülen solunum yolu hastalıkları, bu hastalıkların gebeliğe etkileri ve gebeliğin bu hastalıklar üzerindeki etkileri anlatılacaktır.

PNÖMONİLER

Gebelikte pnömoni insidansı 1000 doğumda 0,78-2,7 arasında değişmektedir (4). ABD'de şiddetli sepsisli gebelerin %30'nda pnömoni saptanmıştır (5). Gebelikte pnömoni risk faktörleri; anemi, astım, sigara, kortikosteroid kullanımı, tokolitik ajanlar, immun yetmezlik, immunsupresif ilaç

¹ Dr.Öğr.Üye., S.B.Ü Konya Eğitim ve Araştırma Hastanesi Kadın Doğum Kliniği, feyzanurincesu@gmail.com

KAYNAKÇA

- Uptodate (2019).Maternal adaptations to pregnancy: Physiologic respiratory changes.(08.08.2019 tarihinde https://www.uptodate.com/contents/maternal-adaptations-to-pregnancy-physiologic-respiratory-changes-and-dyspnea?search=maternal%20adaptation%20to%20pregnancy&source=search_result&selectedTitle=5~150&usage_type=default&display_rank=5 adresinden ulaşılmıştır).
- Lim WS, Macfarlane JT, Colthorpe CL. Pneumonia and pregnancy. *Thorax* 56.5 ;2001: 398-405.
- Simon PM, Schwartzstein RM, Weiss JW et al. Distinguishable types of dyspnea in patients with shortness of breath. *AmRevRespir Dis*;1990 142(5), 1009-1014.
- 4:Goodnight WH, Soper DE. Pneumonia in pregnancy. *Critical caremedicine* 33.10 ;2005: S390-S397.
- Bauer ME, Bateman BT, Bauer ST, et al. Maternal sepsis mortality and morbidity during hospitalization for delivery: temporal trends and independent associations for severe sepsis. *AnesthAnalg* 2013; 117:944.
- Khan S, Niederman MS. Pneumonia in thepregnant-patient. In: *PulmonaryProblems in Pregnancy*, Rose-ne-Montela K, Bourjeily G (Ed), HumanaPress, New York 2009. p.177e96.
- Berkowitz K, LaSala A. Risk factors associated with the increasing prevalence of pneumonia during pregnancy. *AmJObstetGynecol*1990;163:981-5.
- Benedetti TJ, Valle R, Ledger WJ. Antepartum pneumonia in pregnancy. *Am J Obstet Gynecol*1982;144:413-7.
- Madinger NE, Greenspoon JS, Ellrodt AG. Pneumonia during pregnancy: has modern technology improved maternal and fetal outcome? *Am J Obstet Gynecol*1989; 161:657-62.
- Chen YH, Keller J, Wang IT.et al. Pneumonia and pregnancy outcomes: a nation wide population-based study. *American journal of obstetric sand gynecology*;2012: 207(4), 288-e1.
- Pebody RG, Wall PG, Ryan MJ, et al. Epidemiologicalfeatures of Coxiellaburnetiinfection in Englandand Wales:1984 to 1994. *CommunDisRep CDR Rev*1996;6:R128-32.
- Raoult D, Tissot-Dupont H, Foucault C, et al. Q fever1985-1998. *Clinicalandepidemiologicfeatures of 1383infections. Medicine (Baltimore)* 2000;79:109-23.
- Mercieri M., DiRosa R., Pantosti A et al. Critical pneumonia complicating early-stage pregnancy. *Anesthesia& Analgesia*;2010: 110(3), 852-854.
- Rotas M., McCalla S., Liu C. Et al. Methicillin-resistant Staphylococcus aureus necrotizing pneumonia arising from an infected episiotomy site. *Obstetrics&Gynecology*;2007:109(2), 533-536.
- LoweSA. Diagnostic radiography in pregnancy: risks and reality?" *Australian and New Zealand journal of obstetrics and gynaecology* 44.3,2004; 191-196.
- Jartti A, Rauvala E, Kauma H et al. Chest imaging findings in hospitalized patientswith H1N1 influenza. *ActaRadiologica*; 2011: 52(3), 297-304.
- Marrie TJ. Community-acquired pneumonia. *Clinical infectious diseases* 18.4:1994; 501-513.
- Brito V, Niederman MS.Pneumonia complicating pregnancy. *Clinics in ches tmedicine* 32.1; 2011:121-132.
- Gabbe SG, Niebyl JR, Simpson JL et al (2019).Gebelikte Akciğer Hastalıkları. *Obstetri Normal ve sorunlu gebelikler (Cem Fıçıcıoğlu,Pınar Özcan, Çev. Ed) .(S 828-849)*.Ankara: Güneş Kitapevi.
- Campbell SG., Marrie TJ., Anstey R. et al. Utility of blood cultures in the management of adults with community acquired pneumonia discharged from the emergency department. *Emergency medicine journal*;2003: 20(6), 521-523.
- Uptodate (2019):Diagnostic approach to community-acquired pneumonia in adults.(10.08.2019 tarihinde https://www.uptodate.com/contents/diagnostic-approach-to-community-acquired-pneumonia-in-adults?search=pneumonia&source=search_result&selectedTitle=3~150&usage_type=default&display_rank=3#H10 adresinden ulaşılmıştır.)
- Murdoch DR., Laing RT., Mills GD et al. Evaluation of a rapid immunochromatographic test for detection of Streptococcus pneumoniae antigen in urine samples from adults with community-acquired pneumonia. *Journal of Clinical Microbiology*;2001: 39(10), 3495-3498.
- Yu VL., Plouffe JF., Pastoris MC et al. Distribution of Legionella species and serogroups isolated by culture in patients with sporadic community-acquired legionellosis: an international collaborative survey. *The Journal of infectious diseases*; 2001:186(1), 127-128.
- Waterer GW., Baselski VS., Wunderink RG. Legionella and community-acquired pneumonia: a review of current diagnostic tests from a clinician's view point. *The American journal of medicine*;2001: 110(1), 41-48.
- Harrison BD., Farr BM., Connolly CK. et al. The hospital management of community-acquired pneumonia. Recommendations of the British Thoracic Society. *Journal of theRoyal College of Physicians of London*; 1987: 21(4), 267-269.
- GoldenWE., BrownP.,Godsey, N. CMS releases new standards for community acquired pneumonia. *J Ark MedSoc*; 2003: 99(9), 288.
- Cunha BA. Empiric therapy of community-acquired pneumonia: guidelines for theperplexed?.*Chest* 125.5; 2004: 1913-1919.
- Tomlinson MW., Caruthers TJ., Whitty, J. E et al. Does delivery improve maternalcondition in the respiratory-compromised gravida? *Obstetrics&Gynecology*; 1998: 91(1), 108-111
- Akciğer Hastalıkları. Cunningham FG,Leveno KJ, Bloom SL et al. (2016). *WilliamsObstetrik (Gökhan Yıldırım, Çev. Ed)*. (s:1011-1028).Nobel tıp kitabevi.Ankara.
- Munoz FM., Englund JA., Cheesman CC.et al. Maternal immunization with pneumococcal polysaccharide vaccine in the third trimester of gestation. *Vaccine*; 2001: 20(5-6), 826-837.
- Lieberman D., Shimoni A., Shemer-Avni et al.Respiratory viruses in adults with community-acquired pneumonia. *Chest*; 2010: 138(4), 811-816.
- Caliendo, AM. Multiplex PCR and emerging Technologies for the detection of respiratory pathogens. *Clinical Infectious Diseases*;2011: 52(suppl_4), S326-S330.
- Longman RE.,Johnson TR et al. Viral respiratory disease in pregnancy. *Current Opinion in Obstetrics and Gynecology*

- cology;2007:19(2), 120-125.
34. Rodrigues J, Niederman MS et al. Pneumonia complicating pregnancy. *Clinics in chest medicine*;1992:13(4), 679-691.
 35. Siston AM., Rasmussen SA., Honein MA. et al. Pandemic 2009 influenza A (H1N1) virüs illness among pregnant women in the United States. *Jama*; 2010: 303(15), 1517-1525.
 36. American College of Obstetricians and Gynecologists: Assesment and treatment of pregnant women with suspected or confirmed influenza. *Practice Bulletin* No:753, October 2018.
 37. Briggs GG., Freeman RK., Yaffe SJ. *Drugs in pregnancy and lactation: a reference guide to fetal and neonatal risk*, 9th ed. (2011). Lippincott Williams & Wilkins.
 38. Fiore AE., Fry A., Shay D. et al. Centers for Disease Control and Prevention (CDC). Anti viral agents for the treatment and chemoprophylaxis of influenza—recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*, 2011: 60(1), 1-24.
 39. Jamieson DJ., Ellis JE., Jernigan DB. et al. Emerging infectious disease outbreaks: old lessons and new challenges for obstetrician-gynecologists. *American journal of obstetrics and gynecology*;2006: 194(6), 1546-1555.
 40. Zaman K., Roy E., Arifeen SE et al. Effectiveness of maternal influenza immunization in mothers and infants. *New England Journal of Medicine*;2008: 359(15), 1555-1564.
 41. Cox SM., Cunningham FG., Luby J. Management of varicella pneumonia complicating pregnancy. *American journal of perinatology*;1990: 7(04), 300-301.
 42. Esmonde TF, Herdman G., Anderson, G. Chickenpox pneumonia: an association with pregnancy. *Thorax*;1989: 44(10), 812-815.
 43. Whitley RJ. (2012). Varicella Zoster virüs infections. Longo DL, Fauci AS, Kasper DL. et al. (Ed.), *Harrison's Principles of Internal Medicine içinde*, 18. edisyon. New York, McGraw-Hill.
 44. Harger JH., Ernest JM., Thurnau GR. et al. Risk factors and outcome of varicella-zoster virüs pneumonia in pregnant women. *The Journal of infectious diseases*; 2002: 185(4), 422-427.
 45. Smego JR, Asperilla MO. Use of acyclovir for varicella pneumonia during pregnancy. *Obstetrics and gynecology*;1991: 78(6), 1112-1116.
 46. Wilson E., Goss MA., Marin M et al. Varicella vaccine exposure during pregnancy: data from 10 years of the pregnancy registry. *The Journal of infectious diseases*, 197(Supplement_2)2008; S178-S184.
 47. Thomas Jr CF, Limper AH. Pneumocystis pneumonia. *New England Journal of Medicine*;2004: 350(24), 2487-2498.
 48. Walzer PD. (2005). Pneumocystis infection. Longo DL, Fauci AS, Kasper DL. et al. (Ed.), *Harrison's Principles of Internal Medicine içinde* (S:114), 16. edisyon. New York, McGraw-Hill.
 49. Ahmad H., Mehta NJ., Manikal VM et al. Pneumocystis carini pneumonia in pregnancy. *Chest*; 2001: 120(2), 666-671.
 50. Forna F, McConnell M., Kitabire FN et al. Systematic review of the safety of trimethoprim-sulfamethoxazole for prophylaxis in HIV-infected pregnant women: implications for resource-limited settings. *AIDS Rev*;2006: 8(1), 24-36.
 51. Barnes PJ. (2012). *Asthma*. Longo DL, Fauci AS, Kasper DL. et al. (Ed.), *Harrison's Principles of Internal Medicine içinde* (S:2102), 18. edisyon. New York, McGraw-Hill.
 52. Busse WW. NAEP expert panel report: managing asthma during pregnancy: recommendations for pharmacologic treatment—2004 update. *Journal of Allergy and Clinical Immunology*;2005: 115(1), 34-46.
 53. Gluck JC., Gluck PA. The effect of pregnancy on the course of asthma. *Immunology and Allergy Clinics*; 2006: 26(1), 63-80.
 54. Ali Z., Ulrik CS. Incidence and risk factors for exacerbations of asthma during pregnancy. *Journal of allergy*;2013: 6, 53.
 55. Schatz M., Dombrowski MP., Wise R. et al. Asthma morbidity during pregnancy can be predicted by severity classification. *Journal of Allergy and Clinical Immunology*; 2003: 112(2), 283-288.
 56. Schatz M, Dombrowski MP. Asthma in pregnancy. *New England Journal of Medicine*;2010:360(18), 1862-1869.
 57. Murphy VE., Gibson P., Talbot PI. et al. Severe asthma exacerbations during pregnancy. *Obstetrics & Gynecology*;2005: 106(5), 1046-1054.
 58. Getahun D., Ananth CV., Peltier MR. et al. Acute and chronic respiratory diseases in pregnancy: associations with placental abruption. *American journal of obstetrics and gynecology*;2006: 195(4), 1180-1184.
 59. Getahun D., Ananth CV., Oyelese Y. et al. Acute and chronic respiratory diseases in pregnancy: associations with spontaneous premature rupture of membranes. *The Journal of Maternal-Fetal & Neonatal Medicine*;2007: 20(9), 669-675.
 60. Schatz M., Dombrowski MP., Wise R. et al. Spirometry is related to perinatal outcomes in pregnant women with asthma. *American journal of obstetrics and gynecology*; 2006:194(1), 120-126.
 61. Murphy VE., Namazy JA., Powell H et al. A meta-analysis of adverse perinatal outcomes in women with asthma. *BJOG: An International Journal of Obstetrics & Gynaecology*; 2011:118(11), 1314-1323.
 62. Bracken MB., Triche EW., Belanger K. et al. Asthma symptoms, severity, and drug therapy: a prospective study of effects on 2205 pregnancies. *Obstetrics & Gynecology*;2003: 102(4), 739-752
 63. Schatz M., Dombrowski MP., Wise RJ. et al. The relationship of asthma medication use to perinatal outcomes. *Journal of Allergy and Clinical Immunology*;2004: 113(6), 1040-1045.
 64. Stenius-Aarniala BS., Hedman J., Teramo KA. Acute asthma during pregnancy. *Thorax*;1996: 51(4), 411-414.
 65. Wendel PJ., Ramin SM., Barnett-Hamm C. et al. Asthma treatment in pregnancy: a randomized controlled study. *American journal of obstetrics and gynecology*;1996: 175(1), 150-154.
 66. Fanta CH. Asthma. *N Engl J Med.*; 2009:360:1002
 67. Bakhireva LN., Jones KL., Schatz M. et al. Organization of Teratology Information Specialists Collaborative Research Group. (2007). Safety of leukotriene receptor antagonists in pregnancy. *Journal of Allergy and Clinical Immunology*;2007: 119(3), 618-625.

68. McCallister JW., BenningerCG., Frey HA et al. Pregnancy related treatment disparities of acute asthma exacerbations in the emergency department. *Respiratory medicine*; 2011;105(10), 1434-1440.
69. Park-Wyllie L., Mazzotta P., Pastuszak A.et al. Birth defects after maternal exposure to corticosteroids: prospective cohort study and meta-analysis of epidemiological studies. *Teratology*;2000: 62(6), 385-392.
70. Namazy J., Cabana MD., Scheuerle AB.et al. The Xolair Pregnancy Registry (EXPECT): an observational study of the safety of omalizumab during pregnancy in women with asthma.*Am J Respir Crit Care Med*;2012: 185: A4221.
71. Lazarus SC. Emergency treatment of asthma. *New England Journal of Medicine*;2010: 363(8), 755-764.
72. American College of Obstetricians and Gynecologists:. Asthma in pregnancy.PracticeBulletinnumber 90.Obstet Gynecol. 2008;111:457-464
73. T.C Sağlık Bakanlığı Halk Sağlığı Müdürlüğü, yıllara göre toplam tüberküloz olgu hizi ve tüberküloz insidansı 2005-2017. (24.08.2019 tarihinde https://hsgm.saglik.gov.tr/depo/birimler/ tüberküloz_db/ dosya/Istatistikler/2-Yillara_Gore_Toplam_TB_Olgu_Hizi_ve_TB_Insidansi_2005-2017. pdf adresinden ulaşılmıştır.)
74. El-MessidiA., Czuzoj-ShulmanN., SpenceAR.et al.Medical and obstetric outcomes among pregnant women with tuberculosis: a population-basedstudy of 7.8 million births. *American journal of obstetrics and gynecology*;2016: 215(6), 797-e1.
75. Schaefer G, Zervoudakis IA, Fuchs FF, David S. Pregnancy and pulmonary tuberculosis. *Obstetrics and Gynecology*. 1975;46(6):706-715.
76. Hedvall E. Pregnancy and tuberculosis. *Acta Medica Scandinavica*. 1953;147(supplement 1286):1-101
77. Ormerod P. Tuberculosis in pregnancy and the puerperium. *Thorax*. 2001;56(6):494-499
78. 78:Kishan J, Sailaja, Kaur S. Tuberculosis and pregnancy. In: Proceedings oftheNational Conference on PulmonaryDiseases (NAPCON '01); Nov 2001; Mumbai, Maharashtra.
79. Jana N, Vasishta K, Jindal SK, et al. Perinatal outcome in pregnancies complicated by pulmonary tuberculosis. *International Journal ofGynecology and Obstetrics*. 1994;44(2):119-124
80. Hamadeh MA, Glassroth J. Tuberculosis and pregnancy. *Chest*. 1992;101(4):1114-1120.
81. National Tuberculosis and Leprosy Control Programme. *Workers Manual*. 4th edition. Nigeria, Abuja: Federal Ministry of Health of Nigeria, Department of Public-Health; 2004.
82. Cantwell MR, Shehab ZM, Costello AM, et al. Briefreport: congenital tuberculosis. *New England Journal of Medicine*. 1994;330(15):1051-1054.
83. Nemir R, O'Hare D. Congenital tuberculosis. *American-Journal of Diseases ofChildren*. 1985;139(3):284-287.
84. Griffith, D. E. Mycobacteria as pathogens of respiratory infection. *Infectious disease clinics of North America*;1998: 12(3), 593-611.
85. Present P, Comstock G.W., Tuberculin sensitivity in pregnancy. *American Review of RespiratoryDisease*, vol. 112, no. 3, pp. 413-416, 1975.
86. CastroKG., GoldbergS., Jereb JA. et al. Updated guidelines for using interferon gamma release assays to detect Mycobacterium tuberculosis infection--United States, 2010.
87. CohnDL., O'BrienRJ., Geiter, LJ et al. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR Morb Mortal Wkly Rep*;2010: 49(6), 1-54.
88. Pai, M., Denkinge, CM., KikSV.et al. Gamma interferon release assays for detection of Mycobacterium tuberculosis infection. *Clinical microbiology reviews*;2014: 27(1), 3-20.
89. Lighter-Fisher J, Surette AM. Performance of an interferon-gamma release assay to diagnose latent tuberculosis infection during pregnancy. *Obstet Gynecol* 2012; 119:1088.
90. TaylorAW., Mosimaneotsile B., Mathebula U.et al. Pregnancy outcomes in HIV-infected women receiving long-term isoniazid prophylaxis for tuberculosis and antiretroviral therapy. *Infectious diseases in obstetrics and gynecology*, 2013.
91. World Health Organization. Guidelines for treatment of tuberculosis, 4th edition. WHO, Geneva 2010.(24.08.2019 tarihinde <http://apps.who.int/iris/bitstream/10665/44165/1/9789241547833eng.pdf?ua=1&ua=1> adresinden ulaşılmıştır.)
92. Centers for Disease Control and Prevention (CDC). Recommendations for use of an isoniazid-rifampentine regimen with direct observation to treat latent Mycobacterium tuberculosis infection. *MMWR Morb Mortal Wkly Rep* 2011; 60:1650.
93. 93:Lewitt T, Nebel L, Terracina Set al. Ethambutol in pregnancy: observations on embryogenesis. *Chest*, vol. 66,no. 1, pp. 25-26, 1974.
94. LessnauKDK.,Qarah, S. Multidrug-resistant tuberculosis in pregnancy: case report and review of the literature. *Chest*;2003: 123(3), 953-956.
95. King, JT. Restrictive lung disease in pregnancy. *Clinics in chest medicine*;2012: 13(4), 607-622.
96. BoggessKA., EasterlingTR.,RaghuG.Management and outcome of pregnant women with interstitial and restrictive lung disease. *American Journal of Obstetrics & Gynecology*;1995: 173(4), 1007-1014.
97. Baughman RP, Lower EE. (2012).Sarcoidosis. Longo DL,Fauci AS,Kasper DL.et al.(Ed.),Harrison's Principles of Internal Medicine içinde,18.edisyon.New York ,McGraw-Hill,
98. Lynch IIIJP., KazerooniEA., Gay SE. Pulmonary sarcoidosis. *Clinics in chest medicine*;1997: 18(4), 755-785.
99. De Regt RH. Sarcoidosis and pregnancy. *Obstet Gynecol* ;1987:70:369.
100. Cardonick EH., Naktin J.,Bergbella, V. Neurosarcoidosis diagnosed during pregnancy by thoracoscopic lymph node biopsy. A case report. *The Journal of reproductive medicine*,2000: 45(7), 585-587.
101. SeballosRJ., MendelSG., Mirmiran-YazdyA. Sarcoid cardiomyopathy precipitated by pregnancy with cocaine complications. *Chest*,1994: 105(1), 303-305.
102. Boucher RC. (2012). Kistik Fibrozis. Longo DL,Fauci AS,Kasper DL.et al.(Ed.),Harrison's Principles of Internal Medicine içinde,18.edisyon.New York ,McGraw-Hill,
103. AhmadA., AhmedA.,Patrizio, P. Cystic fibrosis and fertility. *Current Opinion in Obstetrics and Gynecology*

- logy;2013: 25(3), 167-172.
104. Olson GL. (1997, August). Cystic fibrosis in pregnancy. In *Seminars in perinatology* (Vol. 21, No. 4, pp. 307-312). WB Saunders.
105. Edenborough FP, Stableforth DE., Webb AK. et al. Outcome of pregnancy in women with cystic fibrosis. *Thorax*;1995 50(2), 170-174.
106. Cole BN., Seltzer MH., Kassabian J. Parenteral nutrition in a pregnant cystic fibrosis patient. *Journal of Parenteral and Enteral Nutrition*, 1997 11(2), 205-207.
107. Stoller KP. Hyperbaric oxygen and carbon monoxide poisoning: a critical review. *Neurological Research*, 2007;29(2), 146-155
108. Greingor JL, Tosi JM, Ruhlmann S, et al. Acute carbon monoxide intoxication during pregnancy. One case report and review of the literature. *Emerg Med J*. 2001; 18: 399-401.
109. Elkharrat D, Raphael JC, Korach JM, et al. Acute carbon monoxide intoxication and hyperbaric oxygen in pregnancy. *Intensive Care Med*. 1991; 17: 289-292.
110. Friedman P, Guo XM., Stiller RJ. et al. Carbon monoxide exposure during pregnancy. *Obstetrical & gynecological survey*, 2015;70(11), 705-712.
111. Koren G, Sharav T, Pastuszak A. et al. A multicenter, prospective study of fetal outcome following accidental carbon monoxide poisoning in pregnancy. *Reprod Toxicol*. 1991; 5: 397-403.
112. Aubard Y, Magne I. Carbon monoxide poisoning in pregnancy. *BJOG*. 2000; 107: 833-838
113. Yildiz H, Aldemir E, Altuncu E. et al. A rare cause of perinatal asphyxia: maternal carbon monoxide poisoning. *Arch Gynecol Obstet*. 2010; 281: 251-254.
114. Quinn DK, McGahee SM, Politte LC, Duncan GN, Cusin C, Hopwood CJ, et al. Complications of carbon monoxide poisoning: a case discussion and review of the literature. *Prim Care Companion J Clin Psychiatry* 2009;11(2):74-9.
115. Ergözen S, Ercan E. Gebelikte intoksikasyon maruziyeti. *Türkiye Klinikleri J Case Rep* 2017;25(4):155-8. doi:10.5336/caserep.2017-55329
116. Elkharrat D., Raphael JC., Korach JM. et al. Acute carbon monoxide intoxication and hyperbaric oxygen in pregnancy. *Intensive care medicine*, 1991: 17(5), 289-292.