



Prevalence of Streptococcus Group B in Vagina of 35-37 Weeks Iranian Pregnant Women: A systematic review and meta-analysis

Mania Kaveh¹

¹ Zabol University of Medical Sciences, Zabol, Iran

Abstract

Introduction : Group B streptococcus is a gram-positive and encapsulated diplococcus and in most cases forms a colony in the gastrointestinal tract and human reproductive system. This bacterium is an important cause of infection in infants, pregnant women, and adults with underlying disease. The aim of this study was to evaluate the Prevalence of Streptococcus Group B in Vagina of 35-37 Weeks Iranian Pregnant Women.

Methods: Initially, by searching the Internet in internal databases such as Irandoc, Iranmedex, SID, Magiran, Scopus and also Google search engine using the keywords of premature neonatal infection, Streptococcus beta-hemolytic group B, ectopic, gynecological, pregnancy, To collect all the articles published in Persian in prestigious domestic journals and abstracts of articles of domestic conferences, as well as the published results of national research, all existing dissertations that somehow evaluate and study the prevalence of B-hemolytic B streptococcus in women.

Results: Based on the results of meta-analysis of the prevalence of group B beta-hemolytic streptococcus in 5365 patients with 95% confidence interval, 07% was 9.5% (95% CI 06% - 08%).

Conclusion: Given the high prevalence of GBS colonization (07%) in pregnant women in Iran, it is suggested that obstetricians and gynecologists take appropriate measures to prevent this infection in pregnant women and infants.

Keywords: Colonization, Group B Streptococcus, Pregnant Women

Introduction

Group B streptococcus is a gram-positive and encapsulated diplococcus and in most cases forms a colony in the gastrointestinal tract and human reproductive system (1). This bacterium is an important cause of infection in infants, pregnant women, and adults with underlying disease (2). In pregnant women, group B streptococcus causes bacteriuria and chorioamnionitis, and in infants it can cause pneumonia, meningitis, endocarditis, sepsis, and bacteremia (3). These infections sometimes start from inside the uterus (4). Severe infections in pregnant women with GBS can sometimes lead to miscarriage

(5). Research findings have shown that maternal vaginal colonization with GBS can be transmitted to infants. Transmission from mother to baby is vertical and usually occurs after the bladder ruptures (6). In some cases, however, neonatal GBS infection occurs without rupture of the membranes in the uterus before delivery (7). Neonatal infection occurs in two ways: 1- Premature infection that occurs in the first 24 hours to 6 days after birth; And 2- Late infections that occur from 6 to 90 days after birth (8). Studies have shown that vaginal infection with GBS during pregnancy increases the risk of vertical transmission of the infection to infants and the likelihood of late infection (9). Late infection generally presents as meningitis,

sepsis, and pneumonia in infants, and in 90% of cases it manifests within the first 24 hours (10). In studies of infants whose mothers were positive for GBS and had not been treated, half of the cases reported complications such as fetal death, neonatal infection, and infant death (11). If the infection is diagnosed during pregnancy and mothers are treated with antibiotics, the prevalence of the infection in infants is reduced (12). In recent years, following timely treatment measures, the prevalence of infection in infants has decreased compared to previous years, as well as fatal neonatal complication (13). A wide range of different microorganisms including group B streptococci, *Gardnerella vaginalis*, *Escherichia coli*, *Trichomonas* and *Candida albicans* are involved in preterm labor (14). GBS, also known as *Streptococcus agalactiae*, is colonized in the vagina of women and is associated with many gynecological problems such as preterm labor, rupture of the bladder, and postpartum fever (15). Approximately 10-30% of pregnant women who have been colonized with GBS bacteria carry the bacteria in both their rectum and vagina, and 50-70% of these women pass on GBS to their babies (16). Thus, approximately 10-30% of pregnant women who have been colonized with GBS bacteria carry the bacterium in both their rectum and vagina, and 50-70% of these women pass on GBS to their babies. Therefore, identifying GBS colonization in women is essential to prevent neonatal GBS infection.

Methods

Initially, by searching the Internet in internal databases such as Irandoc, Iranmedex, SID, Magiran, Scopus and also Google search engine using the keywords of premature neonatal infection, *Streptococcus beta-hemolytic group B*, ectopic, gynecological, pregnancy, To collect all the articles published in Persian in prestigious domestic journals and abstracts of articles of domestic conferences, as well as the published results of national research, all existing dissertations that somehow evaluate and study the prevalence of *B-hemolytic B streptococcus* in women. , Were performed and all of them were extracted. In the next step, by searching the Pubmed database using the keywords, all the articles published in international journals and summarizing the articles of the women's conference will be held in the field. The study data were entered into STATA statistical software and meta-analyzed. To show the results of meta-analysis, plot Forest was used in which the square size indicates the number of samples in each study and the lines drawn on both sides show a 95% confidence interval for the prevalence of group B beta-hemolytic streptococcus in pregnant women in each study.

Findings

A total of 819 articles were extracted through initial searches in various databases. Of the 819 studies identified by analyzing titles and abstracts, 699 studies were omitted due to irrelevant titles. Out of the remaining 120 studies, 91 articles were deleted. Out of the remaining 29 studies, 11 studies had study criteria. (figure 1).

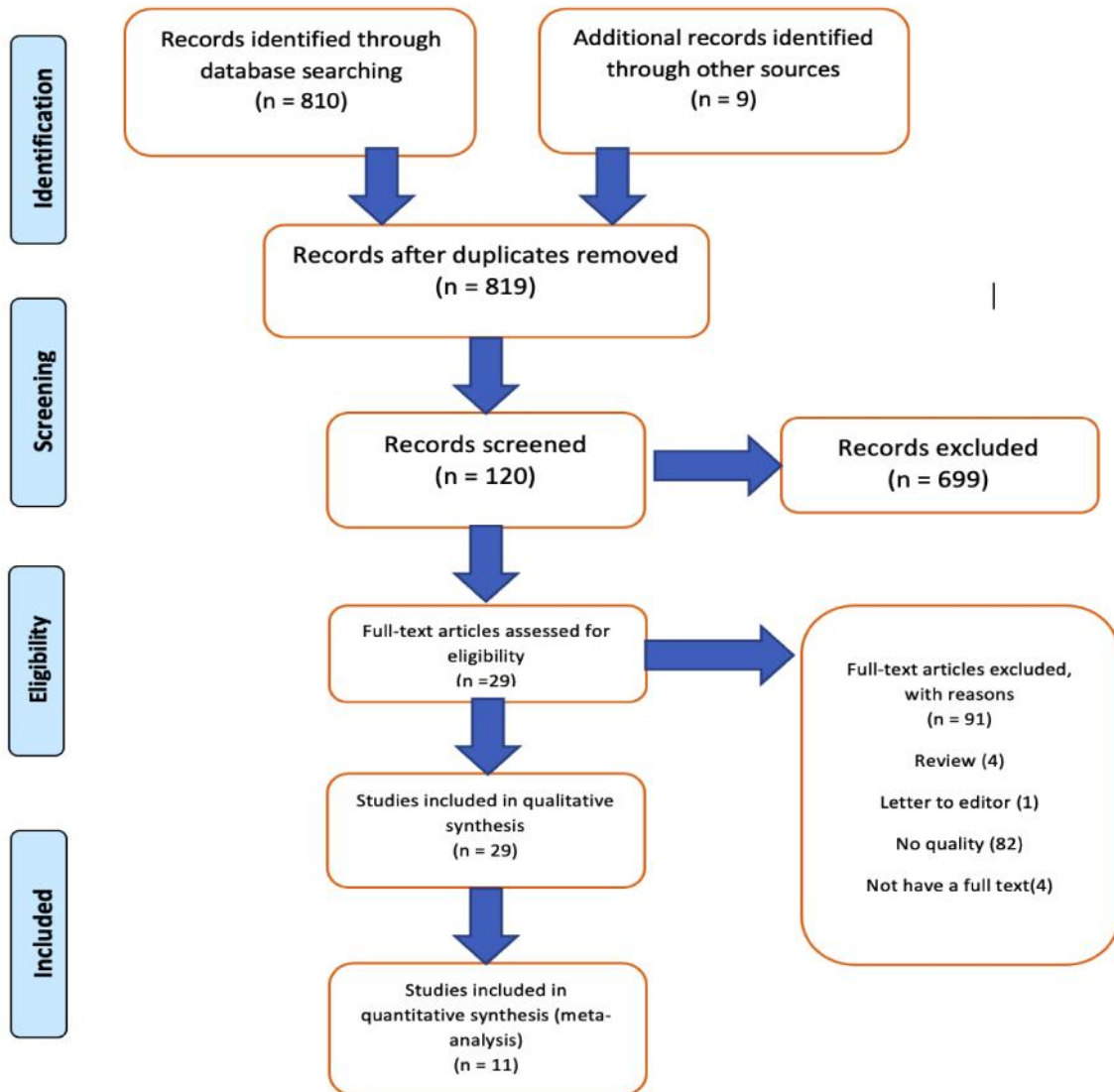


Figure 1: PRISMA flow diagram

A total of 5365 pregnant women were evaluated. All 11 studies were retrospective. A total of 11 studies from 8 provinces that met the inclusion criteria were reviewed. Studies were from Tehran, Kashan, Lorestan, Kermanshah, Kerman, Shiraz and Babol. Easy sampling method was used to select the sample. The risk of bias was low in most studies. The main method of data collection was medical records. The main study sites were hospitals.

Based on the results of meta-analysis of the prevalence of group B beta-hemolytic streptococcus in 5365 patients with 95% confidence interval, 07% was 9.5% (95% CI 06% - 08%) (Figure 2).

Egger diagram was used to examine the bias in publishing articles, and the results showed that the studies have a slight bias ($P < 0.05$) (Figure 3).

Table 1: Summary of included studies

Author	Year	Province	Patient	Prevalence	Age	Se
Sarafrazi ²²	2009	Kashan	400	5.8%	15-46	0.0118
Seyedi ²³	2019	Tehran	1610	7.4%	21-45	0.00652
Sharifi ²⁴	2011	Tehran	250	8.4%	---	0.0175
Nazer ²⁵	2011	Lorestan	100	14%	18-39	0.0346
Behrvash ²⁶	2018	Kermanshah	100	05%	---	0.0217
Kabiri ²⁷	2016	Jahrom	403	16.4%	16-40(27.26)	0.0184
Mansouri ²⁸	2008	Kerman	602	9.1%	---	0.0117
Hassanzadeh ²⁹	2010	Shiraz	310	13.8%	----	0.0197
Shirazi ³⁰	2014	Tehran	980	48=N0.05	19-50	0.0069
Haghshenas ³¹	2014	Babol	400	15.2%	37.9	0.0178
Hadavand ³²	2015	Tehran	210	3.3%	----	0.0117

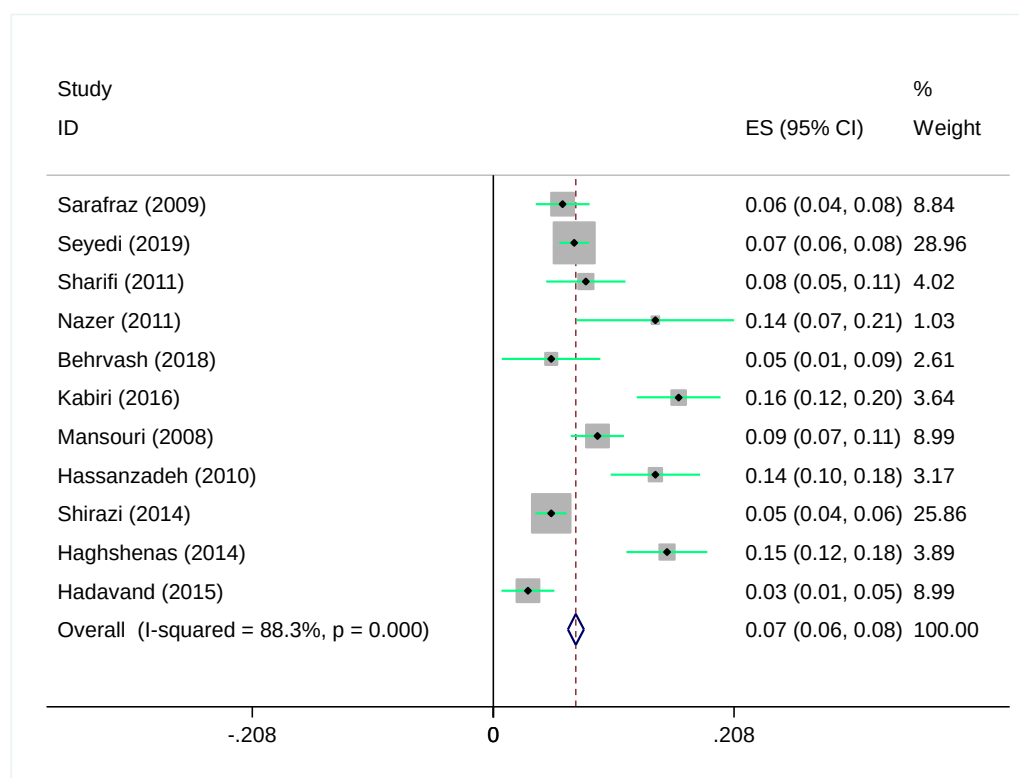


Figure 2: Meta-analysis of the prevalence of Streptococcus Group B in Vagina of 35-37 Weeks Iranian Pregnant Women

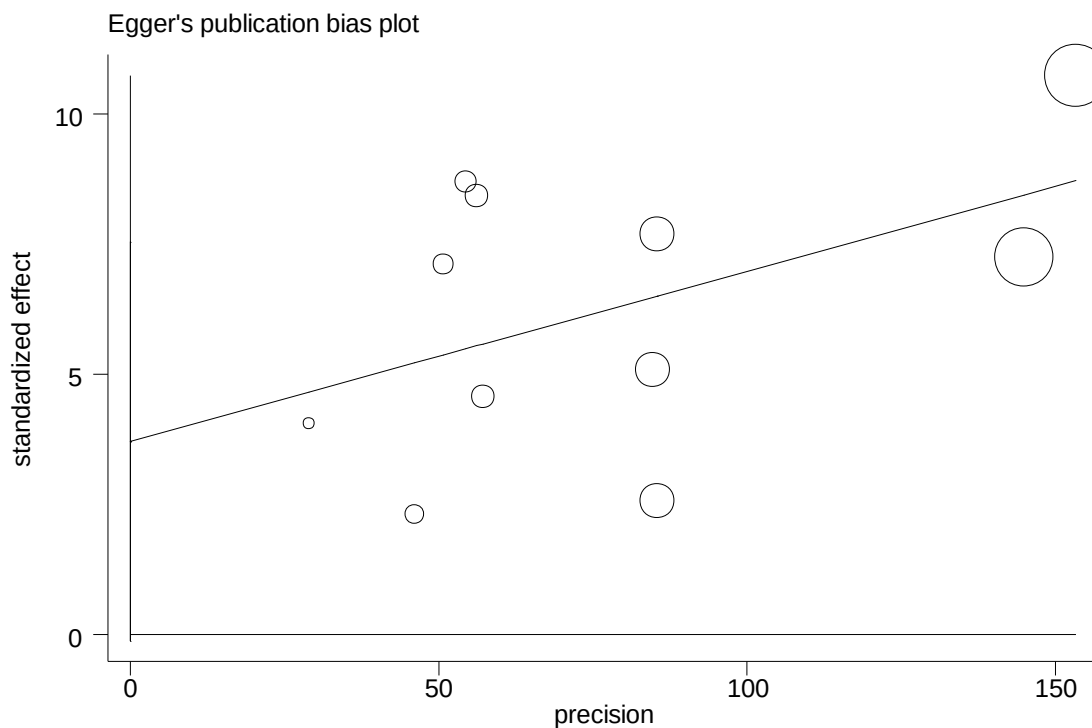


Figure 3:Egger's publication bias of the prevalence of Streptococcus Group B in Vagina of 35-37 Weeks Iranian Pregnant Women

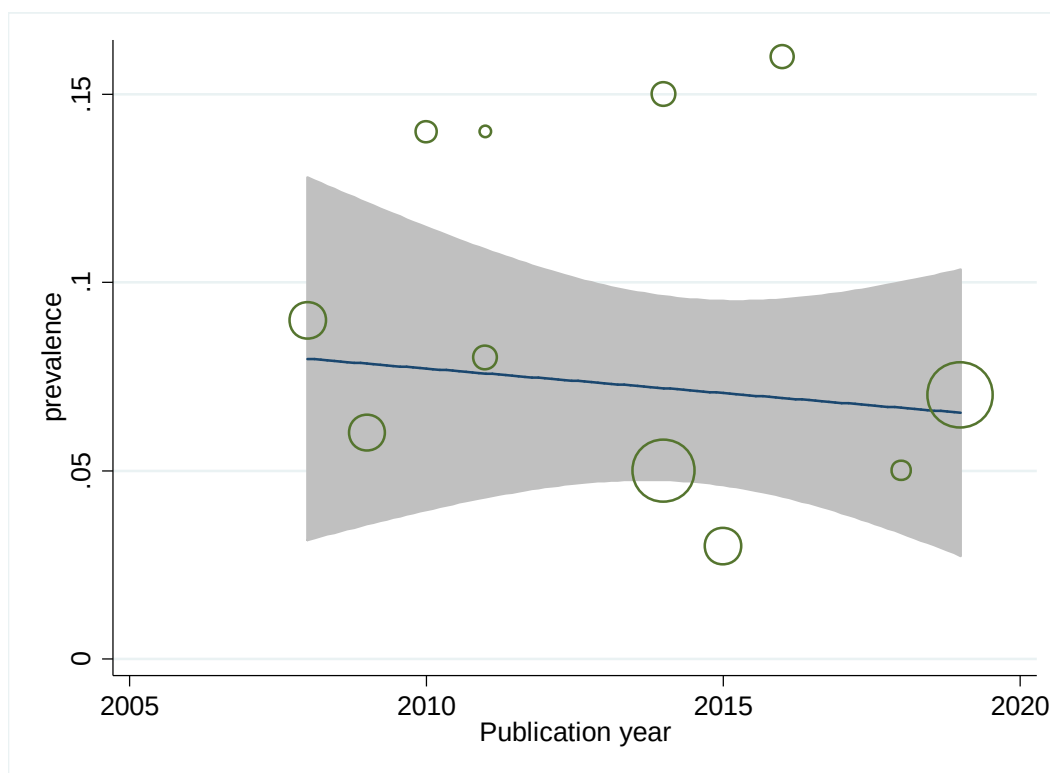


Figure 4:Meta-regression between study publication year and prevalence of the prevalence of Streptococcus Group B in Vagina of 35-37 Weeks Iranian Pregnant Women.

Discussion

In this study, the prevalence of GBS in the vagina of Iranian pregnant women at 35-37 weeks of gestation was investigated. The results showed that the prevalence of GBS among this group of pregnant women was 7%. Findings from demographic variables reinforce the hypothesis that some of them are associated with streptococcal infection. For example, low levels of health care due to living outside of Tehran increase the likelihood that pregnant mothers will carry GBS. Although studies show that up to 50% of infants with GBS are born to carriers without risk factors, in 2002 the CDC guidelines were revised and bacteriological screening became mandatory for all pregnant women at 35-37 weeks of gestation. The prevalence of bacterial vaginosis varies widely among ethnic groups and geographical locations (17-19). Therefore, it is suggested that its relationship with preterm delivery be examined separately in each country. The standard method for the diagnosis of group B colonized streptococcus is based on the culture of vaginal secretions in a medium that inhibits the growth of other microorganisms (20). Factors such as underlying disease, number of abortions, blood pressure, type of prevention method, age and genital diseases do not affect the rate of vaginal colonization with group B beta-hemolytic streptococcus. *Streptococcus agalactiae* is one of the most important causes of disease, infant mortality and postpartum fever in mothers (21). The infection can be transmitted from an infected mother to her baby during delivery. One of the most common causes of meningitis in infants as well as invasive diseases in pregnant women (premature rupture of the bladder) are group B streptococci (*Streptococcus agalactiae*). (This bacterium was first recognized as the most important cause of bacteremia (blood infection) in infants in 3300. The wide difference in the percentage of GBS carriers in Iran may be due to different sampling sites, bacterial load in the swap sample, gestational age at the time of sampling and differences in diagnostic methods. For rapid identification of GBS using culture method based on pigment production, several culture media have been introduced (22). In particular, all pregnant women who should be screened for GBS during the 37-35 weeks of pregnancy and treated with antibiotics, and in order to use antibiotics in a timely manner and to prevent the use of antihistamines in a timely manner. Diagnosis by PCR technique and the sensitivity and accuracy of this technique are recommended for its use.

Conclusion

Given the high prevalence of GBS colonization (07%) in pregnant women in Iran, it is suggested that obstetricians and gynecologists take appropriate measures to prevent this infection in pregnant women and infants.

References

1. Lu B, Li D, Cui Y, Sui W, Huang L, Lu X. Epidemiology of Group B streptococcus isolated from pregnant women in Beijing, China. *Clinical Microbiology and Infection*. 2014 Jun 1;20(6):O370-3.
2. El Aila NA, Tency I, Claeys G, Saerens B, Cools P, Verstraelen H, Temmerman M, Verhelst R, Vaneechoutte M. Comparison of different sampling techniques and of different culture methods for detection of group B streptococcus carriage in pregnant women. *BMC infectious diseases*. 2010 Dec 1;10(1):285.
3. Lee BK, Song YR, Kim MY, Yang JH, Shin JH, Seo YS, Oh KY, Yoon HR, Pai SY, Foxman B, Ki M. Epidemiology of group B streptococcus in Korean pregnant women. *Epidemiology & Infection*. 2010 Feb;138(2):292-8.
4. de-Paris F, Machado AB, Gheno TC, Ascoli BM, de Oliveira KR, Barth AL. Group B Streptococcus detection: comparison of PCR assay and culture as a screening method for pregnant women. *The Brazilian Journal of Infectious Diseases*. 2011 Jul 1;15(4):323-7.
5. Gray KJ, Kafulafula G, Matamba M, Kamdolozi M, Membe G, French N. Group B Streptococcus and HIV infection in pregnant women, Malawi, 2008–2010. *Emerging infectious diseases*. 2011 Oct;17(10):1932.
6. Shirazi M, Abbariki E, Hafizi A, Shahbazi F, Bandari M, Dastgerdy E. The prevalence of group B streptococcus colonization in Iranian pregnant women and its subsequent outcome. *International journal of fertility & sterility*. 2014 Jan;7(4):267.
7. Heyderman RS, Madhi SA, French N, Cutland C, Ngwira B, Kayambo D, Mboizi R, Koen A, Jose L, Olugbosi M, Wittke F. Group B streptococcus vaccination in pregnant women with or without HIV in Africa: a non-randomised phase 2, open-label, multicentre trial. *The Lancet infectious diseases*. 2016 May 1;16(5):546-55.

8. Ji W, Zhang L, Guo Z, Xie S, Yang W, Chen J, Wang J, Cheng Z, Wang X, Zhu X, Wang J. Colonization prevalence and antibiotic susceptibility of Group B Streptococcus in pregnant women over a 6-year period in Dongguan, China. *PloS one*. 2017 Aug 15;12(8):e0183083.
9. Kaveh M, Kashi AM, Sadegi K, Forghani F. Pregnancy in non-communicating rudimentary horn of a unicornuate uterus. *International journal of fertility & sterility*. 2018 Jan;11(4):318.
10. Yadeta TA, Worku A, Egata G, Seyoum B, Marami D, Berhane Y. Vertical transmission of group B Streptococcus and associated factors among pregnant women: a cross-sectional study, Eastern Ethiopia. *Infection and drug resistance*. 2018;11:397.
11. Taminato M, Fram D, Torloni MR, Belasco AG, Saconato H, Barbosa DA. Screening for group B Streptococcus in pregnant women: a systematic review and meta-analysis. *Revista latino-americana de enfermagem*. 2011 Dec;19(6):1470-8.
12. Madhi SA, Dangor Z, Heath PT, Schrag S, Izu A, Sobanjo-ter Meulen A, Dull PM. Considerations for a phase-III trial to evaluate a group B Streptococcus polysaccharide-protein conjugate vaccine in pregnant women for the prevention of early-and late-onset invasive disease in young-infants. *Vaccine*. 2013 Aug 28;31:D52-7.
13. Javanmanesh F, Eshraghi N. Prevalence of positive recto-vaginal culture for Group B streptococcus in pregnant women at 35-37 weeks of gestation. *Medical Journal of the Islamic Republic of Iran*. 2013 Feb;27(1):7.
14. Kaveh M, Tahermanesh K, Kashi AM, Tajbakhsh B, Mansouri G, Sadegi K. Endometriosis of diaphragm: a case report. *International journal of fertility & sterility*. 2018 Oct;12(3):263.
15. Alp F, Findik D, Dagi HT, Arslan U, Pekin AT, Yilmaz SA. Screening and genotyping of group B streptococcus in pregnant and non-pregnant women in Turkey. *The Journal of Infection in Developing Countries*. 2016 Mar 31;10(03):222-6.
16. Russell NJ, Seale AC, O'Driscoll M, O'Sullivan C, Bianchi-Jassir F, Gonzalez-Guarin J, Lawn JE, Baker CJ, Bartlett L, Cutland C, Gravett MG. Maternal colonization with group B Streptococcus and serotype distribution worldwide: systematic review and meta-analyses. *Clinical infectious diseases*. 2017 Nov 6;65(suppl_2):S100-11.
17. Kaveh M. SLEEP DISORDERS IN IRANIAN PREGNANT WOMEN: A SYSTEMATIC REVIEW AND META-ANALYSIS. *International Journal of Pharmaceutical and Biological Science Archive*. 2019 Nov 10;7(6).
18. Dangor Z, Kwatra G, Izu A, Adrian P, van Niekerk N, Cutland CL, Adam Y, Velaphi S, Lala SG, Madhi SA. HIV-1 is associated with lower Group B Streptococcus capsular and surface-protein IgG antibody levels and reduced transplacental antibody transfer in pregnant women. *The Journal of infectious diseases*. 2015 Aug 1;212(3):453-62.
19. Carrillo-Ávila JA, Gutiérrez-Fernández J, González-Espín AI, García-Triviño E, Giménez-Lirola LG. Comparison of qPCR and culture methods for group B Streptococcus colonization detection in pregnant women: evaluation of a new qPCR assay. *BMC infectious diseases*. 2018 Dec 1;18(1):305.
20. Hong JS, Choi CW, Park KU, Kim SN, Lee HJ, Lee HR, Choi EH, Park KH, Suh CS, Kim BI, Choi ST. Genital group B Streptococcus carrier rate and serotype distribution in Korean pregnant women: implications for group B streptococcal disease in Korean neonates. *Journal of perinatal medicine*. 2010 Jul 1;38(4):373-7.
21. Page-Ramsey SM, Johnstone SK, Kim D, Ramsey PS. Prevalence of Group B Streptococcus Colonization in Subsequent Pregnancies of Group B Streptococcus-Colonized versus Noncolonized Women. *American journal of perinatology*. 2013 May;30(05):383-8.
22. Sarafrazi, Mesdaghinia, Moniri, Rezvan, Mousavi, Seyed Gholamabbas. Prevalence of group B beta hemolytic streptococcal vaginal flora in pregnant women and its relationship with preterm neonatal infections and infections during pregnancy. *Feyz Scientific Research Journal :: Kashan University of Medical Sciences*. 2001 Jul 10; 5 (2):22-7.
23. Sidi Moghaddam, Nayreh, Nomanpour, Lashgari, Peyman. Prevalence of group B streptococcus in the vagina of pregnant women 37-35 weeks. *Scientific Quarterly of Sarem Encyclopedia in Reproductive Medicine*. 2018 Dec 10; 3 (1): 1-4.
24. Sharifi Yazdi MK, Bakhtiari RO, Mobasser GO, Soltan Dallal MM, Khalili MB. Study of molecular epidemiologic of Group B Streptococcus colonization in pregnant women by PCR method. *Journal of Payavard Salamat*. 2011 Sep 10;5(2):51-60.

25. Nazer, M.R., Rafiei Alavi, E., Nazer, E. and Khamechi, M., 2011. Prevalence of Group B Streptococcus Vaginal Colonization in The Third Trimester of Pregnancy. *SSU_Journals*, 19(1), pp.13-23.
26. Behrvash S, Raeisi F. Detection of GBS (scpB gene) Carriers in Pregnant Women in Kermanshah By phenotypic and Colony PCR Methods. *scientific journal of ilam university of medical sciences*. 2018 Jun 10;26(2):37-44.
27. Kabiri S, Kargar-Jahromi Z, Solhjoo K, Sadeghi-Jahromi S. Frequency of Group B Streptococcus Colonization in pregnant women in Jahrom, 2014. *Journal of Jahrom University of Medical Sciences*. 2016 Apr 10;14(1):19-26.
28. Mansouri, S., E. Ghasami, and N. Shahabi Najad. "Vaginal colonization of group B streptococci during late pregnancy in southeast of Iran: incidence, serotype distribution and susceptibility to antibiotics." *J Med Sci* 8, no. 6 (2008): 574-78.
29. Hassanzadeh P, Motamedifar M, Gharaghani MN. Carriage rate of group B streptococci in pregnant women in three teaching hospitals in Shiraz, Iran. *Medical Principles and Practice*. 2011;20(3):277-82.
30. Shirazi M, Abbariki E, Hafizi A, Shahbazi F, Bandari M, Dastgerdy E. The prevalence of group B streptococcus colonization in Iranian pregnant women and its subsequent outcome. *International journal of fertility & sterility*. 2014 Jan;7(4):267.
31. Haghshenas Mojaveri M, Zahedpasha Y, Asnafi N, Farhadi J, Haddad G. A survey on the prevalence of group B Streptococcus in pregnant women referred to the obstetrics and Gynecology ward at babol Ayatollah Rouhani hospital. *Iranian Journal of Neonatology IJN*. 2014;5(1):23-7.
32. Hadavand S, Ghafoorimehr F, Rajabi L, Davati A, Zafarghandi N. Frequency of group B Streptococcal colonization in pregnant women aged 35-37 weeks in clinical centers of Shahed University, Tehran, Iran. *Iranian journal of pathology*. 2015;10(2):120.

Access this Article in Online	
	Website: www.ijarbs.com
	Subject: Medical Sciences
Quick Response Code	
DOI: 10.22192/ijarbs.2021.08.01.006	

How to cite this article:

Mania Kaveh. (2021). Prevalence of Streptococcus Group B in Vagina of 35-37 Weeks Iranian Pregnant Women: A systematic review and meta-analysis. *Int. J. Adv. Res. Biol. Sci.* 8(1): 43-50.
DOI: <http://dx.doi.org/10.22192/ijarbs.2021.08.01.006>