



UNDERSTANDING SPONTANEOUS ABORTION: A COMPREHENSIVE REVIEW FROM MODERN MEDICINE TO AYURVEDIC PERSPECTIVES

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<https://doi.org/10.46607/iamj09p9022025>

(Published Online: January 2025)

Open Access

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Article Received: 17/12/2024 - Peer Reviewed: 05/01/2025 - Accepted for Publication: 14/01/2025.



ABSTRACT

This research explores spontaneous abortion (SA) through modern medical and Ayurvedic perspectives, addressing its definition, prevalence, aetiology, classification, and pathophysiology. A narrative literature review was carried out on spontaneous abortion, which involved synthesising and summarising the existing research on the topic in a cohesive narrative form. An extensive literature search for relevant studies regarding Spontaneous Abortion and its Ayurvedic correlation was conducted using the PubMed Central database from 2000 to 2024. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed during the process. SA is broadly defined as the loss of pregnancy before 20–24 weeks of gestation or of a fetus weighing under 500 g. While globally, 10–15% of clinically recognised pregnancies end in miscarriage, actual rates may be higher due to undetected losses. Factors such as chromosomal abnormalities, uterine malformations, autoimmune conditions, and lifestyle influences contribute to SA, with many cases remaining idiopathic. Modern

insights highlight mechanisms like tissue necrosis, inflammation, thrombosis, and genetic or epigenetic changes. The Ayurvedic framework classifies pregnancy loss as *Garbhasrava* and *Garbhapata*, correlating with fetal development stages. Conditions like *Putraghni Yonivyapath* and *Garbhasravi Vandhyatva* emphasise dietary, lifestyle, and psychological factors that aggravate *Vata* and *Pitta doshas*, leading to *Rakta-pitta dushti* (blood vitiation) and *Kshetra dushti* (uterine dysfunction). Ayurvedic etiologies align with modern risk factors like endometrial insufficiency, inflammatory responses, and chromosomal abnormalities. The Ayurvedic focus on *Ritu* (timing), *Kshetra* (uterine health), *Ambu* (nutrition), and *Beeja* (genetic quality) parallels modern reproductive health concepts such as preconception care and uterine receptivity. Integrating these insights from Ayurveda and modern medicine offers a holistic approach to SA prevention and management, highlighting the potential for complementary therapies to improve maternal and fetal health outcomes.

Keywords: Spontaneous abortion, Pathophysiology, *Garbhasravi vandhyathva*, *Putraghni yonivyapath*

INTRODUCTION

Pregnancy loss or miscarriage is the most common pregnancy complication in obstetrics, which refers to the termination of pregnancy before the fetus survives (La *et al.*, 2021). By definition, spontaneous abortion (SA) is the termination of pregnancy before 20-28 completed gestational weeks from the last menstrual period, or less than 500 g fetal weight (Gupta *et al.*, 2007). But the definition of SA varies in different countries and regions because SA is a frequency descriptive disease. SA could be commonly referred to as a ‘miscarriage’ to avoid association with induced abortion. Early pregnancy loss refers only to SA in the first trimester; however, the first trimester is when the most spontaneous abortions occur. SA being one of the most common first-trimester complications, is affecting over 15% of pregnant women in the childbearing age and can rise up to 45% (Cardoso *et al.*, 2021).

About 20-30% of women with confirmed pregnancies bleed during the first 20 weeks of pregnancy where about half of these women spontaneously abort. Thus, the incidence of spontaneous abortion is up to about 20% in confirmed pregnancies. Incidence in all pregnancies is probably higher because some very early abortions are mistaken for a late menstrual period (Dulay, 2022).

There are several different types of spontaneous abortion as early or late, spontaneous or induced, threatened or inevitable, incomplete or complete, missed, recurrent and septic. Determining the type is essential

in implementing the most appropriate management (Dulay, 2022).

Spontaneous Abortion can be compared with *Garbhasravi Vandhyatva* according to Ayurveda, which is described in the textbooks as *Harita Samhita* under the topic Infertility. The expulsion of a fetus up to the fourth month of pregnancy is termed as *Garbhasrava*, and thereafter in the fifth and sixth months, it is termed as *Garbhapata*, because by this period the fetal parts would have attained some stability. *Durdhara Jataharini* (1st trimester abortion), *Vasya Jataharini* (2nd trimester abortion), *Putraghni* and *Asrija* or *Apraja Yonivyapad* which have been mentioned in Ayurvedic classics denote repeated abortion. It is mentioned in *Rasa* and *Shukrapradoshaja Vikara* by *Acharya Charaka*. Etiology is very similar to that mentioned in modern texts. Taking into account the causes of abortions, *Yonivyapad* and *Jataharini*, the following factors may be held responsible for abortion, infliction by *Jataharini*, *Krimi* (infectious maternal or fetal), *Aghata* (trauma-physical or psychological), *Bijadosa* (chromosomal defect), *Yonidosha* (anatomical abnormalities of the reproductive system), *Artavadoshaja* (abnormalities of hormones), *Kaladosha* (late secretory phase impregnation or age factor), *Ahara* (use of non-congenial diet), *Vihara* (abnormal mode of life), and aggravated *Vayu* located in *Shukra*. This leads to the aggravation of *Apanavayu*, which produces pain in the flanks, lower abdomen, neck of bladder, etc., and troubles

the young fetus with bleeding. It is included among the eighty disorders of *Vata* (Singh, Sengar and Khuntia, 2018).

There are many formulations mentioned in Ayurvedic classics to be used in repeated abortion. According to Ayurvedic basic principles, the main aggravated *Dosha* in *Garbhasravi Vandhyatva* is *Vata*, therefore the medicines and principle of management in recurrent abortions should be selected according to the vitiated *Dosha* (Singh, Sengar and Khuntia, 2018).

Methodology

Narrative Literature Review

The narrative literature review on spontaneous abortion involved synthesising and summarising the existing research on the topic in a cohesive narrative form. The review started with an introduction that provides background information on spontaneous abortion (also known as miscarriage), its prevalence, and its significance as a reproductive health issue. It was briefly explained why understanding the causes, risk factors, and implications of spontaneous abortion are important. Then the search strategies were described which were used to identify relevant studies. This included databases searched, keywords used, inclusion/exclusion criteria, and any limitations of the search. The criteria used to select studies for inclusion in this review were outlined including the factors such as publication date, study design, language and relevance to the research question. Then it was explained how data were extracted from the selected studies. This involved summarising key findings, identifying common themes, and noting any discrepancies or contradictions in literature. The recurring themes, patterns, and trends in the literature related to spontaneous abortion were identified and discussed. This included the factors associated with increased risk of spontaneous abortion (e.g., maternal age, medical conditions, lifestyle factors), potential mechanisms of action, and approaches to prevention and management. Any gaps or limitations in the existing literature were acknowledged including the areas where research is lacking, conflicting findings, methodological limitations of individual studies, or biases

in the literature. Finally, the main findings of the literature review were summarised and their implications for clinical practice, research, and public health policy were discussed. Any key recommendations for future research or interventions to address spontaneous abortion were highlighted as well.

Systematic Literature Review

A rigorous and structured approach was involved in systematic review on spontaneous abortion to synthesise existing research. An extensive literature search for relevant studies regarding Spontaneous Abortion and its Ayurvedic correlation was conducted using the PubMed Central database from 2000 to 2024. During the process, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed. The following keywords and MeSH terms were used: "Spontaneous Abortion" AND "Definition", "Miscarriage" AND "Definition", "spontaneous abortion" AND "prevalence", "miscarriage" and "prevalence", "spontaneous abortion" AND "review", "miscarriage" AND "progesterone". All studies were independently examined only by their title to eliminate duplicates, case studies, uncontrolled trials, trials that did not have desired outcomes, and trials published in languages other than English. The remaining articles were carefully read in their entirety to determine whether they contained information on the topic of interest. Furthermore, the reference sections for reviewing articles and other relevant studies were searched manually for additional eligible studies.

Results

Definition of Spontaneous Abortion

To describe the failure of an early pregnancy, many terms have been used including early pregnancy loss, early pregnancy failure, miscarriage, and spontaneous abortion. A pregnancy loss is the spontaneous demise of a pregnancy, which has been confirmed by at least two positive β -human chorionic gonadotropin (β -hCG) measurements in the serum or urine where under normal, non-neoplastic conditions, β -hCG is ex-

clusively produced by the syncytiotrophoblast (Kolte *et al.*, 2015).

Rouse *et al.*, (2017) have compared the existing definitions in which pregnancy loss has been defined uniquely by many organizations i.e. The National Center for Health Statistics, The Centers for Disease Control and Prevention, The International Classification of Diseases, 10th revision (ICD-10), The World Health Organization (WHO), The European Medicines Agency, The United Kingdom, who use a common definition about abortion as pregnancy termination prior to 20-24 weeks gestation or a fetus born weighing 350-500 g. In ICD-10 definition, it also includes the assumption that expulsion of products of conception occurs without deliberate interference and before the fetus is viable.

As per WHO, the legal requirements for the registration of fetal deaths and therefore the threshold to consider a stillbirth versus abortion vary from country to country and even within countries. Therefore, WHO recommends that, if possible, all foetuses weighing at least 500 g at birth, whether alive or dead, should be included in the statistics and when information on birth weight is unavailable, the corresponding criteria for gestational age (22 complete weeks) or body length (25 cm crown-heel) should be used (WHO, 2006).

Prevalence of Spontaneous Abortion

Although miscarriages are common, there is a lack of systematic registration and limited research in epidemiology regarding the topic (Helle *et al.*, 2022). It is estimated that globally, 10-15% of clinically recognized pregnancies result in miscarriage. However, the actual incidence of miscarriage could be higher as many women experience very early miscarriages without ever realizing that they were pregnant. Studies have indicated that the rate of spontaneous miscarriage in India is approximately 10%. However, Patki and Chauhan (2016) observed a much higher prevalence (32%) of spontaneous miscarriage in Indian women. Furthermore, when undetected pregnancies are considered, an even higher miscarriage rate of 31% has been reported (Lim *et al.*, 2013).

Another study which investigated the trends in pregnancy outcomes prevalence during 2015–2021 in Indian women, analysed the data presented in the fourth (2015-16) and fifth (2019-21) rounds of National Family Health Survey, which observed that a higher proportion of pregnancy loss, particularly miscarriages had increased in both urban (6.4% vs. 8.5%) and rural areas (5.3% vs. 6.9%), showing an increase in the frequency of miscarriages among Indian women during 2015-2021 (Kuppusamy *et al.*, 2023).

In a study conducted in Manitoba, Canada, it was estimated that 1 in 9 pregnant women experience and seek medical care for a miscarriage. Over the 2003-2014 period, an average annual rate of miscarriage of 11.3% was estimated, which should be a reasonably accurate estimate of the number of women who seek medical care for a loss (Strumpf *et al.*, 2021).

Classification of Spontaneous Abortion

Abortions may be classified as early or late abortion, spontaneous or induced abortion, threatened or inevitable abortion, incomplete or complete abortion, missed abortion, recurrent and septic abortion (Dulay, 2022).

Quinley *et al.*, (2015) mentions the types of miscarriage as stable, inevitable, incomplete and complete abortion which has yet to be studied. Threatened miscarriage is a term used to describe vaginal bleeding during the first 20 weeks of pregnancy, with or without pain, while the cervix remains closed, and the fetus is still viable and located within the uterus. This condition can range from small spots of blood to life-threatening shock. However, once the cervix begins to dilate, miscarriage and pregnancy loss are unavoidable (Haas, Hathaway and Ramsey, 2019).

When the fetus is non-viable and the cervix is closed, this is known as a missed miscarriage or missed abortion (Wahabi *et al.*, 2018). In missed abortions, the product of conception remains either in whole or in incomplete miscarriage. It remains in part in the uterine cavity and is called the “Retained product of conception” (de Codt *et al.*, 2020).

Aetiology and Risk Factors

It has been estimated that, in over half of miscarriages, a chromosomal abnormality is present. Other risk factors include maternal age greater than 35 years, multiple pregnancies, uterine malformations, polycystic ovaries, autoimmune factors (such as phospholipid antibodies, lupus anticoagulant and anticardiolipin antibodies), genetic disorders, poorly controlled diabetes, and having had two or more miscarriages (Haas, Hathaway and Ramsey, 2019). In a study conducted by Ali *et al.* (2020) to evaluate the aetiology and pregnancy outcome of recurrent miscarriage women, they found that endocrinological disorders (39%) were the major pathological factor for recurrent miscarriage. Other factors included uterine abnormalities (5.7%), vitamin D3 deficiency (3.5%), psychological factors (3.2%), infection (3.6%), autoimmune abnormalities (1.8%) and protein S deficiency (1.8%). However, 40% of cases were idiopathic.

San Lazaro Campillo *et al.* (2018), in the study conducted to explore university students' understanding of rates, causes, and risk factors of miscarriage, have shown that advanced maternal and paternal age, heavy smoking, alcohol consumption, infertility and previous miscarriage can be considered as well-known risk factors.

Ford and Schust (2009), in their study conducted on recurrent pregnancy loss, have found accepted etiologies, which include parental chromosomal abnormalities, untreated hypothyroidism, uncontrolled diabetes mellitus, specific uterine anatomical abnormalities, and antiphospholipid antibody syndrome (APS). Other probable or possible etiologies include additional endocrine disorders, heritable and/or acquired thrombophilias, immunologic abnormalities, infections, and environmental factors. In this study, it was also found that luteal phase defect (LPD), polycystic ovarian syndrome (PCOS), diabetes mellitus, thyroid disease, and hyperprolactinemia are among the endocrinologic disorders implicated in approximately 17% to 20% of RPL.

Smoking, through exposure to substances like nicotine and carbon monoxide, is associated with several severe complications during pregnancy, including

increased rates of spontaneous abortion (Lambers & Clark, 1996). However, a study carried out from June 2008 to March 2009 to find the relationship between environmental tobacco smoke, stress and miscarriage and preterm births demonstrated no association between cotinine, cortisol, miscarriage and preterm births (Arffin, Al-Bayat and Hassan, (2012). Chen, Chen and Xu (2021) have found that low vitamin D levels can increase the risk of premature delivery, spontaneous abortion and neonatal small-for-gestational age (SGA).

Khadra *et al.* (2022) performed a cross-sectional study of gendered physical and mental health concerns of 507 Syrian refugee women (≥ 18 years old) living in non-camp settings in Jordan. This study has revealed that there is limited research that delves into identifying the risk factors that contribute to miscarriage. Findings from research conducted on women in general populations suggest that chromosomal abnormalities, which increase in incidence as maternal age advances, are the leading cause of miscarriage. Moreover, heightened rates of miscarriage have been associated with chronic illnesses, such as thyroid diseases or diabetes mellitus, gender-based health disparities, including domestic violence, and mental health disorders like depression and posttraumatic stress disorder. While these health conditions result from various environmental factors, there exist certain controllable risk factors that could potentially lower the likelihood of miscarriage, such as seeking prenatal care.

Pathophysiology

The process of miscarriage begins a few weeks after the embryo's demise. It starts with haemorrhaging in the decidua basalis, the endometrial area supporting the implanted site. This haemorrhaging, tissue necrosis and inflammation in the surrounding area causes the gestational sac and implanted ovum to detach. This detachment triggers contractions in the uterus and dilation of the cervix, ultimately leading to the expulsion of the pregnancy (Lim *et al.*, 2013).

Among the patients who had a history of spontaneous abortions, the researchers discovered several associ-

ated conditions. Out of the cases of secondary non-idiopathic recurrent miscarriage, the study identified various thrombophilias, including 4 cases of antiphospholipid syndrome, 2 cases of thrombocytosis, as well as one case each of autoimmune thyroiditis, uterine tumour, MTHFR C homozygous thrombophilia, and FVL heterozygous thrombophilia (Manolea *et al.*, 2015).

According to a comparative cytogenetic study conducted by Pendina *et al.* (2014), in women of different ages, both natural conception and IVF can lead to miscarriages due to various factors such as infections, immunological pathologies, endocrinological, epigenetic, and genetic changes. The study found that cytogenetic abnormalities are a significant cause of pregnancy loss, with numerical and structural chromosomal aberrations present in up to 70% of cases. Maternal age is a crucial factor in embryonic aneuploidy, particularly in women aged over 35 years. It is still unclear whether the mode of conception (natural or ART) has an impact on the rate of abnormal embryonic karyotype. In this study, it was also revealed that the majority of pregnancy failures are linked to cytogenetic abnormalities, with more than 50% of early miscarriages displaying abnormal karyotypes. The underlying cause of karyotype abnormality in pregnancy losses is errors during gametogenesis, fertilisation, and cleavage divisions. The risk of trisomy from nondisjunction events is significantly higher for women aged ≥ 35 years. Interestingly, no difference was observed in the range of miscarriage karyotype abnormality between women who conceived through IVF and those who conceived naturally in this study. In both groups, the spectrum of abnormalities included nondisjunction events such as monosomies, trisomies, and multiple trisomies, errors in fertilisation, such as triploidy, errors in the first mitotic cleavage division, such as tetraploidy, and structural rearrangements as well as combined pathology (structural + numerical abnormalities). Sporadic miscarriages can be caused by immunological abnormalities arising from qualitative and quantitative changes of decidual and uterine natural killer cells, as well as immunological incompatibility be-

tween the mother and the fetus. Several endocrinological and endometrial factors are known to trigger pregnancy loss. At the same time, pathomorphological changes such as chronic inflammation has been identified as a common cause of abortions with a normal karyotype. The impact of thrombophilia, antiphospholipid syndrome, and thyroid autoimmunity on sporadic fetal loss has also been established. In addition to a woman's health, correct epigenetic marking of the embryonic genome is vital for normal prenatal development. Following fertilisation, the human embryo undergoes global changes in DNA methylation patterns necessary for subsequent tissue-specific epigenetic marking. Epimutations leading to inappropriate DNA methylation may contribute to the occurrence of early euploid pregnancy loss. Recent studies have shown altered methylation patterns in numerous genes in miscarriages, supporting this concept.

Razdaibiedina *et al.* (2018) conducted a study to investigate genetic factors that contribute to the risk of spontaneous abortion in Ukrainian women, which was the first to examine the individual effects of genes and the effects of genetic interactions on the risk of miscarriage, focusing on SNPs of cytokines, TLR, and PGR genes. The normal functioning of reproductive processes in women relies on the coordinated functioning of neural, immune, and endocrine mechanisms. Cytokines, Toll-like receptors, and progesterone receptors regulate these processes, including cell signalling, immune responses, and pregnancy course control. Excessive proinflammatory cytokines such as TNF α , IL-8, and IL-6 are linked to preterm birth, whereas anti-inflammatory cytokines such as IL-10 and TGF- β 1 promote normal fetal development. However, the traditional Th1/Th2 ratio model oversimplifies the relationship between cytokine production and pregnancy outcomes, as individual genetic variation affects cytokine production levels and responses. TLR single-nucleotide polymorphisms can lead to variation in the identification of infectious agents during pregnancy, with mutant TLR SNPs associated with an increased risk of miscarriage due to immune system imbalance and chronic inflamma-

tion. While PGR gene expression variations affect pregnancy outcomes, the relationship between PGR gene SNPs and pregnancy loss remains uncertain. In this study, it was concluded that the development of spontaneous abortion has been linked to critical roles played by TLR9 and IL-10 SNPs. The risk of miscarriage can be increased when these genotypes co-occur with other genotypes, thus exhibiting double genetic interaction. TLR9 interacts with IL-6 and IL-8, while IL-10 interacts with TLR4. TLR2, TLR4, IL-6, IL-8, and PGR SNPs can also affect the risk of miscarriage, albeit to a lesser extent than TLR9 and IL-10. However, no association was found between TGF- β 1 and TNF α polymorphisms and miscarriage. TNF- α overexpression in the decidual tissues and peripheral blood of recurrent spontaneous abortion (RSA) patients was detected in a study by Cao *et al.* (2021), which aimed to identify the therapeutic mechanism of a traditional Chinese medicine preparation on specific target proteins involved in RSA. The IL-10 levels were significantly lower in RSA than during normal pregnancy. The involvement of TLR4 and C-C chemokine ligand 2 (CCL2) in RSA development was shown before, and the serum TLR4 and CCL2 levels in pregnant women could serve as RSA indicators. Reduced TLR4 and increased TLR2 induced by ligand treatment of spermatozoa influenced unexplained RSA. Therefore, they identified that RSA, TNF- α , IL-10, and TLR4 might be targets for their herbal preparation.

Ayurvedic View of Spontaneous Abortion

In Ayurvedic literature, the term *Garbhasrava* refers to the expulsion of the fetus up to the fourth month of pregnancy. In contrast, from the fifth and sixth months onward, it is termed *Garbhapata*. However, *Bhoja* suggests that the period of *Garbhasrava* extends only up to the third month (Prabhu et al., 2024). Acharya Charaka and Sushruta have elaborated on the condition known as *Puthraghni Yonivyapad*, whereas Acharya Vagbhata described *Jathaghni Yonivyapad*. While most classical texts identify the primary clinical manifestation of *Puthraghni Yonivyapad* as recurrent abortions, *Vagbhata* associ-

ates it with repeated neonatal deaths (Rajini, 2022). *Garbhasravi Vandhyatva* is a term introduced by Acharya Harita in his classification of *Vandhyatva*, which denotes recurrent miscarriages. Spontaneous abortion, therefore, can be correlated with both *Puthraghni Yonivyapath* and *Garbhasravi Vandhyatva* as described in Ayurvedic classics. Acharya Charaka did not explicitly classify *Vandhyatva*, but his writings suggest three sequential types: (i) *Vandhya* - absolute sterility resulting from the congenital absence of the uterus and/or *Artava*, or the state of absolute sterility; (ii) *Apraja* - primary infertility in which a woman conceives after receiving treatment; (iii) *Sapraja* - a condition in which a woman, after giving birth to one or more children, is unable to conceive during her reproductive age. *Harita Samhita* identifies *Vandhyatva* as a distinct condition and defines it as the inability to have children rather than merely the inability to conceive. *Harita's* classification includes six types of *Vandhyatva*: (i) *Kakavandhya* (secondary infertility) - a woman who fails to conceive after giving birth to one child; (ii) *Anapatya* (primary infertility) - a woman who never conceives; (iii) *Garbhasravi* - a lady who experiences recurrent abortions; (iv) *Mritavatsa* - a woman who repeatedly gives birth to stillborn babies; (v) *Dhatukshaya* - a woman who fails to conceive due to the loss of *bala* or strength; and (vi) Infertility caused by *Garbhasamkocha* resulting from sexual intercourse with a girl before her menarche (*Ajatarajasa*) (Shukla Upadhyaya, Karunagoda and Dei, 2010). The prognosis of *Vandhyatva* depends on the underlying causes. If the infertility is due to incurable conditions such as *Yonivyapad* or *Artava Vyapad* classified as *Asadya* (incurable), the outcome is unfavourable. According to Acharya Charaka, congenital *Vandhyatva* is *Asadya*. However, *Garbhasravi Vandhyatva*, as per Acharya Harita, is considered *Sadya* (curable) (Rajini, 2022).

Aetiology and pathophysiology according to Ayurveda

Acharya Sushruta identifies four essential factors necessary for the occurrence and continuation of a

healthy pregnancy, collectively termed *Ritu* (optimal timing), *Kshetra* (healthy reproductive system), *Ambu* (nutritional fluid), and *Beeja* (healthy sperm and ovum). According to Ayurveda, disruptions in pregnancy or conception arise due to *Aharaja* (dietary), *Viharaja* (lifestyle), and *Manasika* (psychological) causes, which lead to *Artava Dushti* (menstrual irregularities) and *Apanakshetra Vikruti* (disorders of the reproductive tract) (Prabhu et al., 2024). In conditions like *Garbhasravi Vandhya* (recurrent miscarriages) and *Puthraghni Yonivyapad* (repeated loss of foetuses), various *Nidanas* (causative factors) such as the consumption of *Ruksha*, *Katu*, *Amla*, and *Lavana Ahara* (dry, spicy, sour, or salty foods, including pickles and fried items), improper sleep patterns (*Akala Nidra* or *Anidra*), and psychological stressors like grief (*Soka*), anger (*Krodha*), and fear (*Bhaya*) can aggravate *Vata* and *Pitta Doshas*. This aggravation also impacts *Rakta Dosh*, leading to *Rakta-Pitta Dushti* (blood disorders), which can cause pregnancy loss. *Vayu's Ruksha Guna* (dry property) can lead to chromosomal abnormalities, reduced endometrial thickness (unfavourable for implantation and pregnancy maintenance), and disturbances in organogenesis. Similarly, *Pitta Prakopa* (aggravation of *Pitta*) can result in *Rakta Dushti* (vitiation of blood), causing inflammatory responses that adversely affect placentation and fetal nourishment. These imbalances create a hostile uterine environment (*Kshetra Dushti*) for the developing fetus, contributing to spontaneous abortion. If the quality of *Sukra* (sperm) and *Artava* (ovum) is compromised, the resulting conceptus will lack vitality, making it challenging to sustain pregnancy. Consequently, these factors result in spontaneous abortion and/or recurrent pregnancy loss, referred to as *Garbhasravi Vandhya*. *Acharya Charaka* explains that when *Vayu* is aggravated due to excessive consumption of *Ruksha Ahara* (dry foods) and a lifestyle that promotes dryness, it repeatedly destroys the fetus along with vitiated *Sonita* (blood). *Chakrapani* further elaborates that, although this condition leads to the loss of foetuses of both sexes, male foetuses are more commonly affected, which is why the condition is termed *Puthraghni*. *Acharya*

Sushruta describes this condition as one in which foetuses that have attained stability are repeatedly lost due to bleeding, accompanied by clinical features of disordered *Pitta*, such as burning sensations and heat. Both *Vagbhata*s observe that when *Vayu*, due to its *Rukshatha* (dryness), repeatedly destroys neonates immediately after birth, which were conceived and developed from vitiated *Artava*, the condition is known as *Jataghni* (Rajini, 2022).

DISCUSSION

The findings presented in this research encompass a comprehensive understanding of spontaneous abortion (SA), delving into its definition, prevalence, classification, aetiology, risk factors, pathophysiology, and an Ayurvedic perspective of SA. The study delineates the various terms to describe pregnancy loss, emphasising the importance of standardised definitions across different organisations and regions. The consensus typically revolves around the termination of pregnancy before 20-24 weeks gestation or a fetus born weighing 350-500 g, with the expulsion of products of conception occurring without deliberate interference (Rouse *et al.*, 2017; WHO, 2006). Despite being common, miscarriages face challenges in systematic registration and epidemiological research. Globally, it is estimated that 10-15% of clinically recognised pregnancies result in miscarriage, with potentially higher rates considering undetected pregnancies. Studies in India and Canada highlight both regional and temporal variations in miscarriage rates, underscoring the need for ongoing monitoring and research to understand trends (Helle *et al.*, 2022; Kuppusamy *et al.*, 2023; Strumpf *et al.*, 2021). The classification of SA encompasses various dimensions, including timing, inevitability, completeness, and recurrence. Understanding these classifications is crucial for appropriate management strategies (Dulay, 2022; Quinley *et al.*, 2015). A multitude of factors contribute to miscarriages, including chromosomal abnormalities, maternal age, uterine malformations, autoimmune factors, genetic disorders, and lifestyle factors like smoking and nutrition. Endocrinological disorders, psychological factors, and infections also

play significant roles, with a considerable portion of cases remaining idiopathic (Haas, Hathaway and Ramsey, 2019; Ali *et al.*, 2020; San Lazaro Campillo *et al.*, 2018; Ford & Schust, 2009; Chen, Chen and Xu, 2021; Khadra *et al.*, 2022). Miscarriages involve a complex interplay of factors, including tissue necrosis, inflammation, thrombophilias, genetic abnormalities, and immunological responses. Studies highlight the importance of cytogenetic abnormalities, maternal age, epigenetic changes, and genetic interactions in pregnancy loss (Lim *et al.*, 2013; Manolea *et al.*, 2015; Pendina *et al.*, 2014; Razdaibiedina *et al.*, 2018; Cao *et al.*, 2021).

The Ayurvedic understanding of spontaneous abortion is deeply rooted in its holistic approach to health and disease. The terms *Garbhasrava* and *Garbhapata* classify pregnancy losses based on gestational age. *Garbhasrava* refers to fetal loss up to the fourth month, and *Garbhapata* covers losses in the fifth and sixth months. These classifications align with the development stages of the fetus described in Ayurveda. The condition *Puthraghni Yonivyapad*, described by *Acharya Charaka* and *Sushruta*, focuses on recurrent abortions, with a unique perspective by *Vagbhata*, who associates the condition with repeated neonatal deaths. This highlights the diverse understanding of pregnancy losses across Ayurvedic texts. The concept of *Vandhyatva* (infertility) in Ayurveda further emphasises the multifactorial aetiology of reproductive disorders, including habitual abortions and recurrent pregnancy losses. *Acharya Harita's* classification, which includes *Garbhasravi* (recurrent miscarriages) and *Mritavatsa* (stillbirths), demonstrates that infertility is not limited to the inability to conceive but also encompasses the inability to sustain a viable pregnancy. *Harita's* classification also underlines the role of systemic and lifestyle factors in reproductive health. The pathophysiological framework in Ayurveda identifies disruptions in pregnancy as arising from *Aharaja* (dietary), *Viharaja* (lifestyle), and *Manasika* (psychological) causes. These factors aggravate *Vata* and *Pitta Doshas*, leading to *Rakta-Pitta Dushti* (blood vitiation) and *Kshetra Dushti* (a hostile uterine environment). Modern parallels can be drawn

between these descriptions and conditions, such as endometrial insufficiency, inflammatory processes, and chromosomal abnormalities. For example, the aggravation of *Vayu (Ruksha Guna)* leading to reduced endometrial thickness and chromosomal aberrations corresponds to known risk factors for recurrent pregnancy loss. Similarly, *Pitta Prakopa*, which causes *Rakta Dushti* and inflammatory responses, can be compared to placental dysfunction and related complications. Additionally, the Ayurvedic emphasis on nutrition (*Ambu*), optimal timing (*Ritu*), a healthy reproductive system (*Kshetra*), and genetic factors (*Beeja*) resonate with modern concepts of preconception health, uterine receptivity, and genetic viability. The conditions *Puthraghni*, characterised by repeated fetal loss, and *Jataghni*, associated with neonatal deaths, illustrate how Ayurveda integrates psychosomatic and systemic factors into the understanding of reproductive health.

CONCLUSION

Based on the provided findings, it is evident that spontaneous abortion (SA) is a complex phenomenon influenced by various factors such as chromosomal abnormalities, maternal age, lifestyle choices, and physiological processes. The research highlights the importance of standardised definitions and classification systems to facilitate better understanding and management of SA. Additionally, insights from the Ayurvedic perspective offer valuable contributions to comprehending the condition. Addressing SA requires interdisciplinary approaches that integrate modern medical science with traditional viewpoints. Researchers and healthcare professionals can develop more effective prevention and management strategies by combining insights from different disciplines. This underscores the need for ongoing research and collaboration to improve outcomes for individuals affected by SA and their families.

Suggestions and Recommendations

Based on the comprehensive findings presented in this research, several suggestions can be made to advance the understanding and management of sponta-

neous abortion (SA). Given the variation in definitions and classifications of SA across different regions and organisations, there is a need for standardised terminology and criteria. Collaborative efforts among healthcare organisations and regulatory bodies can help establish universally accepted definitions and classifications, facilitating better epidemiological research and clinical management. Despite being a common pregnancy complication, there is a lack of systematic registration and limited research in epidemiology regarding SA. Investing in comprehensive epidemiological studies can provide valuable insights into the prevalence, trends, and risk factors associated with SA, helping guide preventive strategies and healthcare policies. SA involves a complex interplay of factors ranging from chromosomal abnormalities to lifestyle choices and physiological processes. Adopting interdisciplinary approaches integrating modern medical science with traditional perspectives, such as Ayurveda, can enrich the understanding of SA and lead to more holistic management strategies. Early detection of SA types, such as threatening or inevitable miscarriage, can facilitate timely interventions and potentially improve outcomes. Healthcare providers should receive training in recognising the signs and symptoms of SA, enabling prompt diagnosis and appropriate management strategies. Considering the multifactorial nature of SA, personalised medicine approaches tailored to individual risk profiles and underlying etiologies hold promise for optimising patient care. Integrating genetic testing, hormonal assessments, and lifestyle modifications into clinical practice can help tailor treatment strategies to each patient's unique needs. Providing education and support to individuals and families affected by SA is essential for addressing the emotional and psychological aspects of pregnancy loss. Community-based initiatives, support groups, and online resources can offer valuable support networks and information to those navigating the challenges of SA. In summary, addressing the complexities of SA requires a multifaceted approach encompassing standardisation of definitions, robust epidemiological research, interdisciplinary collaboration, personalised medicine ap-

proaches, and community support initiatives. By collectively advancing our understanding and management of SA, we can strive to improve outcomes and support individuals and families affected by pregnancy loss.

REFERENCES

1. Ali S, Majid S, Niamat Ali M, Taing S, El-Serehy HA, Al-Misned FA. Evaluation of aetiology and pregnancy outcome in recurrent miscarriage patients. *Saudi journal of biological sciences*. 2020;27(10):2809-2817. <https://doi.org/10.1016/j.sjbs.2020.06.049>
2. Arffin F, Al-Bayaty FH, Hassan J. Environmental tobacco smoke and stress as risk factors for miscarriage and preterm births. *Archives of gynecology and obstetrics*. 2012;286(5):1187-1191. <https://doi.org/10.1007/s00404-012-2417>
3. Cao L, Chen H, Huang Y, Chen L, Kang M, Liang J. The Pharmacological Activity of the Wenjing Decoction in Recurrent Spontaneous Abortion. *Evidence-based complementary and alternative medicine: eCAM*. 2021;8861394. <https://doi.org/10.1155/2021/8861394>
4. Cardoso RMANN, Cardoso PLNNN, Azevedo AP, Cadilla JS, Amorim MGROR, Gomes MER, Pinto JMNC. First-trimester miscarriage: A histopathological classification proposal. *Helion*. 2021;7(3):E06359. <https://doi.org/10.1016/j.heliyon.2021.e06359>
5. Chen B, Chen Y, Xu Y. Vitamin D deficiency in pregnant women: Influenced by multiple risk factors and increase the risks of spontaneous abortion and small-for-gestational age. *Medicine*. (2021);100(41):e27505. <https://doi.org/10.1097/MD.00000000000027505>
6. de Codt M, Balza C, Jadoul P, Forget P, Squifflet JL, Bernard P, Luyckx M. Hysteroscopic Resection for Missed Abortion: Feasibility, Operative Technique and Potential Benefit Compared to Curettage. *Frontiers in surgery*. 2020;7:64. <https://doi.org/10.3389/fsurg.2020.00064>
7. Dulay AT. Spontaneous Abortion. *MSD Manual Professional Version*. 2022. [Accessed 18 April 2023]. Available from: <https://www.msdmanuals.com/professional/gynecology-and-obstetrics/abnormalities-of-pregnancy/spontaneous-abortion#>

8. Ford HB, Schust DJ. Recurrent pregnancy loss: etiology, diagnosis, and therapy. *Reviews in obstetrics and gynecology*. 2009;2(2):76-83.
9. Gupta S, Agarwal A, Banerjee J, Alvarez JG. The Role of Oxidative Stress in Spontaneous Abortion and Recurrent Pregnancy Loss: A Systematic Review. *Obstetrical and gynecological survey*. 2007;62(5):335-347 DOI: 10.1097/01.ogx.0000261644.89300.df
10. Haas DM, Hathaway TJ, Ramsey PS. Progesterone for preventing miscarriage in women with recurrent miscarriage of unclear etiology. *The Cochrane database of systematic reviews*. 2019(11):CD003511. <https://doi.org/10.1002/14651858.CD003511.pub5>
11. Helle N, Niinimäki M, Linnakaari R, But A, Gissler M, Heikinheimo O, Mentula M. National register data are of value in studies on miscarriage-Validation of the healthcare register data in Finland. *Acta obstetrica et gynecologica Scandinavica*. 2022;101(11):1245-1252. <https://doi.org/10.1111/aogs.14445>
12. Khadra MM, Suradi HH, Amarin JZ, El-Bassel N, Kaushal N, Jaber RM, Al-Qutob R, Dasgupta A. Risk factors for miscarriage in Syrian refugee women living in non-camp settings in Jordan: results from the Women ASPIRE cross-sectional study. *Conflict and health*. 2022;16(1):32. <https://doi.org/10.1186/s13031-022-00464-y>
13. Kolte AM, Bernardi LA, Christiansen OB, Quenby S, Farquharson RG, Goddijn M, Stephenson MD. Terminology for pregnancy loss prior to viability: a consensus statement from the ESHRE early pregnancy special interest group. *Human reproduction (Oxford, England)*. 2015;30(3):495-498. <https://doi.org/10.1093/humrep/deu299>
14. Kuppasamy P, Prusty RK, Chaithanya IK, Gajbhiye RK, Sachdeva G. Pregnancy outcomes among Indian women: increased prevalence of miscarriage and stillbirth during 2015-2021. *BMC pregnancy and childbirth*. 2023;23(1):150. <https://doi.org/10.1186/s12884-023-05470-3>
15. La X, Wang W, Zhang M, Liang L. Definition and Multiple Factors of Recurrent Spontaneous Abortion. *Advances in Experimental Medicine and Biology*. 2021;1300:231-257
16. Lambers DS, Clark KE. The maternal and fetal physiological effects of nicotine. *Seminars in perinatology*. 1996;20(2):115-126. [https://doi.org/10.1016/s0146-0005\(96\)80079-6](https://doi.org/10.1016/s0146-0005(96)80079-6)
17. Lim CE, Ho KK, Cheng NC, Wong FW. Combined oestrogen and progesterone for preventing miscarriage. *The Cochrane database of systematic reviews*. 2013(9), CD009278. <https://doi.org/10.1002/14651858.CD009278.pub2>
18. Manolea MM, Dijmărescu AL, Neamțu S, Alexandru DO, Rică R, Gogăna A, Novac L. Statistical Correlations of the Spontaneous Abortion with Trombophilia and Other Associated Pathologies. *Current Health Sciences Journal*. 2015;41(2):158-164. <https://doi.org/10.12865/CHSJ.41.02.11>
19. Patki A, Chauhan N. An Epidemiology Study to Determine the Prevalence and Risk Factors Associated with Recurrent Spontaneous Miscarriage in India. *Journal of obstetrics and gynaecology of India*. 2016;66(5):310-315. <https://doi.org/10.1007/s13224-015-0682-0>
20. Pendina AA, Efimova OA, Chiryayeva OG, Tikhonov AV, Petrova LI, Dudkina VS, Sadik NA, Fedorova ID, Galembo IA, Kuznetzova TV, Gzgzayan AM, Baranov VS. A comparative cytogenetic study of miscarriages after IVF and natural conception in women aged under and over 35 years. *Journal of assisted reproduction and genetics*. 2014;31(2):149-155. <https://doi.org/10.1007/s10815-013-0148-1>
21. Prabhu P, Mallikarjun S, Swamy S, Patil I, Hiremath S. Ayurvedic management of Garbhasravi Vandhyatwa w.s.r. to Recurrent Pregnancy Loss - A Case Study. *J Ayurveda Integr Med Sci*. 2024;6(351-356). <http://dx.doi.org/10.21760/jaims.9.6.58>
22. Quinley KE, Falck A, Kallan MJ, Datner EM, Carr BG, Schreiber CA. Validation of ICD-9 Codes for Stable Miscarriage in the Emergency Department. *The western journal of emergency medicine*. 2015;16(4):551-556. <https://doi.org/10.5811/westjem.2015.4.24946>
23. Rajini P. Ayurvedic perspective of recurrent pregnancy loss. *Ayushdhara*. 2022;9(3):105-107.
24. Razdaibiedina A, Khobzey M, Tkachenko V, Vorobiova I. Effects of Single-Nucleotide Polymorphisms in Cytokine, Toll-Like Receptor, and Progesterone Receptor Genes on Risk of Miscarriage. *Obstetrics and Gynecology International*. 2018, 9272749. <https://doi.org/10.1155/2018/9272749>
25. Rouse CE, Eckert LO, Babarinsa I, Fay E, Gupta M, Harrison MS, Kawai AT, Kharbanda EO, Kucuku M, Meller L, Mallett Moore T, Subelj M, Kochhar S, Tavares-Da-Silva F, Global Alignment of Immunization Safety in Pregnancy (GAIA) Abortion Work Group, and Brighton Collaboration Abortion Working Group. Spontaneous abortion and ectopic pregnancy:

- Case definition and guidelines for data collection, analysis, and presentation of maternal immunisation safety data. *Vaccine*. 2017;35(48):6563-6574. <https://doi.org/10.1016/j.vaccine.2017.01.047>
26. San Lazaro Campillo I, Meaney S, Sheehan J, Rice R, O'Donoghue K. University students' awareness of causes and risk factors of miscarriage: a cross-sectional study. *BMC women's health*. 2018;18(1):188. <https://doi.org/10.1186/s12905-018-0682-1>
27. Shukla Upadhyaya K, Karunagoda K, Dei LP. Infertility caused by tubal blockage: An ayurvedic appraisal. *Ayu*. 2010;31(2):159-166. <https://doi.org/10.4103/0974-8520.72378>
28. Singh NK, Sengar AS, Khuntia BB. Management of Garbhastravi Vandhya (Repeated Abortion) with Ayurvedic Intervention: A Case Report. *J Res Ayurvedic Sci*. 2018;2(4):247-253. https://www.researchgate.net/publication/344706633_Manage-ment_of_Garbhastravi_Vandhya_Repeated_Abortion_with_Ayurvedic_Intervention_A_Case_Report
29. Strumpf E, Lang A, Austin N, Derksen SA, Bolton JM, Brownell MD, Chateau D, Gregory P, Heaman MI. Prevalence and clinical, social, and health care predictors of miscarriage. *BMC pregnancy and childbirth*. 2021;21(1):185. <https://doi.org/10.1186/s12884-021-03682-z>
30. Wahabi HA, Fayed AA, Esmail SA, Bahkali KH. Progesterone for treating threatened miscarriage. *The Cochrane database of systematic reviews*. 2018;8(8): CD005943. <https://doi.org/10.1002/14651858.CD005943.pub5>
31. World Health Organization. Neonatal and perinatal mortality: country, regional and global estimates. Geneva, Switzerland. 2006.

Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Tharangani, W. A. S. et al: Understanding Spontaneous Abortion: A Comprehensive Review from Modern Medicine to Ayurvedic Perspectives. *International Ayurvedic Medical Journal* {online} 2025 {cited January 2025} Available from: http://www.iamj.in/posts/images/upload/153_164.pdf