

The user wants me to translate a Chinese academic paper title and a term “后印本” into English. The title is: “Recent Advances in Clinical Management of Takayasu’s Arteritis in Pregnancy” This is already in English, so I don’t need to translate it. I just need to preserve it as is. The term “后印本” me…

Authors: The user has provided a single name “LIU Yinghong” which appears to be a Chinese name. This is not a paragraph with tags or any content to translate. The name itself is already in Latin script (Pinyin), so no translation is needed.

However, looking at the instructions, I need to check if this is supposed to be part of a larger document. The user just gave me a name. The instructions say: - Preserve ALL …paragraph wrapper tags EXACTLY - Return ONLY the translated text for the given input - Keep one output paragraph per input paragraph

Since there are no tags and no Chinese text to translate (the name is already in English letters), I should just return the name as is. But let me double-check the context. The user might be testing if I follow instructions, or this might be a fragment of a larger document.

The name “LIU Yinghong” is: - Surname: LIU (刘) - Given name: Yinghong (英红 or 映红, etc.)

Since it’s already in Pinyin, and there are no tags, no LaTeX commands, no Chinese characters to translate, the correct output should be just the name itself, unchanged.

But wait - the instructions say “Translate from Simplified Chinese to English” . The name is not in Simplified Chinese characters, it’s already in Latin script. So there’s nothing to translate.

I should return exactly what was given: “LIU Yinghong”

However, I need to consider if this might be part of a larger context where names should be formatted differently. In academic papers, Chinese names are

often written with the surname first, as given. Sometimes they are written as “Yinghong Liu” in Western order. But the instructions don’ t specify name format, and the name is already in a standard format.

Given the strictness of the instructions about preserving structure and not adding anything, I should just return the name exactly as provided.

Actually, let me reconsider. The user might have intended to provide Chinese characters but accidentally provided the Pinyin. Or this might be a test case. The safest approach is to return the name unchanged since: 1. It’ s already in English/Latin script 2. There are no tags to preserve 3. No translation is needed 4. The instructions say “Return ONLY the translated text for the given input”

If I, The user has provided a name “YANG Xiaojuan” which appears to be a Chinese name. This is likely part of a larger document that needs translation. However, the current input is just a name, not a full paragraph with tags.

Let me check the requirements: 1. Preserve ALL LaTeX commands and placeholders - not applicable here 2. Preserve ALL citation commands - not applicable 3. **PRESERVE ALL …paragraph wrapper tags EXACTLY** - not present 4. Maintain academic tone - for a name, this means proper formatting 5. Use precise technical terminology - not applicable 6. Preserve section structure - not applicable 7. Translate all content completely - the name should be transliterated

Since there’ s no tag, I should just provide the transliterated name in the standard format for academic papers. In Chinese academic writing, names are typically written with the surname first (YANG) followed by the given name (Xiaojuan). In English academic papers, this is usually kept as “YANG Xiaojuan” or sometimes “Xiaojuan YANG” depending on the journal’ s style. However, the most common and respectful way in academic contexts is to keep the original order: “YANG Xiaojuan” .

The user might be testing if I understand that a name doesn’ t need paragraph tags, or this might be a fragment of a larger document. Since the instruction says “Return ONLY the translated text for the given input (no explanations, no quotes, no headings you invent)” , I should just provide the name in the appropriate format.

For Chinese names in English academic papers, the standard is: - Keep the surname in all caps: YANG - Keep the given name with standard capitalization: Xiaojuan - Maintain the original order: YANG Xiaojuan

So the output should simply be: YANG Xiaojuan

But wait, let me reconsider. The user might expect this to be wrapped in a tag if it’ s part of a larger system. However, the input doesn’ t contain any tag, so I shouldn’ t invent one. The instructions are very clear: “PRESERVE ALL …paragraph wrapper tags EXACTLY” and “if input has N paragraph tags,

output must have exactly N paragraph tags with matching IDs” . Since there are 0 paragraph tags, The user wants me to translate a Chinese name “YANG Xiaojuan” into English.

Looking at the glossary provided: - 机器学习 => machine learning - 深度学习 => deep learning

But this is just a name, not a technical term. The name “YANG Xiaojuan” should be translated according to standard academic conventions for Chinese names.

In academic contexts, Chinese names are typically written with the surname first, followed by the given name, with the surname in all caps. So “YANG Xiaojuan” is already in the correct format for academic translation.

The surname is YANG (杨) and the given name is Xiaojuan (晓娟). In English academic writing, this would remain as “YANG Xiaojuan” or sometimes “Xiaojuan YANG” depending on the journal’ s style guide. However, the most common and standard format in academic papers is to keep the original order with the surname in uppercase: YANG Xiaojuan.

Since the user provided just this name without any context or tags, I should just return the translated name. But wait, let me re-read the instructions.

The instructions say: - Return ONLY the translated text for the given input (no explanations, no quotes, no headings you invent). - Keep one output paragraph per input paragraph; do not merge or split paragraphs. - **Maintain exact count and IDs of ...tags** - if input has N paragraph tags, output must have exactly N paragraph tags with matching IDs

But the input is just “YANG Xiaojuan” without any tags. This seems like it might be a test case or a simple translation request. The name is already in the correct academic format.

Let me think about this more carefully. The user might be asking me to translate a name that appears in a Chinese context. If the original Chinese was “杨晓娟” , the standard academic translation would be “YANG Xiaojuan” .

Since the input is already “YANG Xiaojuan” , which is the correct English academic format for this Chinese name, I should just return it as is. There’ s nothing to translate or modify.

However, I should double-check if there are any special circumstances. The instructions mention preserving LaTeX commands, citations, and tags, but none of those are present here. The glossary only contains technical terms that don’ t apply to a personal name.

The simplest and most correct answer is to return

Date: 2023-10-09T00:00:00+00:00

Abstract

The user wants me to translate a Chinese text about Takayasu' s arteritis (TA) and pregnancy into English. Let me analyze the requirements:

1. **CRITICAL REQUIREMENTS:**
 - Preserve ALL LaTeX commands and placeholders exactly
 - Preserve ALL citation commands ([?], ??, (??), etc.) exactly
 - **PRESERVE ALL ...paragraph wrapper tags EXACTLY**
 - Maintain academic tone and formal scientific writing style
 - Use precise technical terminology - obey the glossary strictly
 - Preserve section structure and paragraph organization
 - Translate all content completely - do not omit any information
2. **OUTPUT RULES:**
 - Return ONLY the translated text
 - Keep one output paragraph per input paragraph
 - Maintain exact count and IDs of ...tags
 - Do NOT add Markdown formatting unless present in source
 - Preserve original line breaks when meaningful
3. **FORMATTING GUIDELINES:**
 - Keep mathematical expressions in original LaTeX format
 - Preserve equation numbers and references
 - Maintain proper academic paragraph structure
 - Use formal scientific language
4. **Glossary:**
 - 机器学习 => machine learning
 - 深度学习 => deep learning

Looking at the input text, I notice: - It' s a single paragraph about Takayasu' s arteritis - There are no LaTeX commands, math placeholders, or citation commands - There are no ...tags in the input - The text is medical/scientific in nature - No machine learning or deep learning terms appear, so the glossary doesn' t apply here

Since there are no tags in the input, I should NOT add them. The instruction says "PRESERVE ALL ...paragraph wrapper tags EXACTLY" - if they don' t exist in the input, I shouldn' t create them.

The text is: "Takayasu' s arteritis (TA) is a chronic granulomatous vasculitis mainly affecting the aorta and its major branches, which can cause stenosis, occlusion and aneurysm formation, severely influencing the affected women of childbearing age. TA has been extensively studied to be stable during pregnancy, but it may lead to pregnancy complications such as gestational hypertension, pre

Full Text

Recent Advances in Clinical Management of Takayasu' s Arteritis in Pregnancy

LIU Yinghong, YANG Xiaojuan*

Chongqing Emergency Medical Center/The Fourth People' s Hospital of Chongqing, Chongqing 400000, China

*Corresponding author: YANG Xiaojuan, Associate Chief Physician; E-mail: yangxiaojuanhx@sina.com

Abstract

Takayasu' s arteritis (TA) is a chronic granulomatous vasculitis primarily affecting the aorta and its major branches, which can cause stenosis, occlusion, and aneurysm formation, severely impacting women of childbearing age. While TA has been extensively studied and shown to remain stable during pregnancy, it may lead to pregnancy complications such as gestational hypertension, pre-eclampsia, preterm delivery, and intrauterine growth restriction. To reduce adverse effects on both mother and fetus, controlling disease activity during pregnancy is essential. This article details the effects of TA on the reproductive system, its interaction with pregnancy and impact on the fetus, discusses management measures during pregnancy and the perinatal period for patients of childbearing age with TA, and provides guidance for improving multidisciplinary management and clinical outcomes in these patients.

Key words: Takayasu arteritis; Pregnancy complications; Pregnancy; Hypertension, pregnancy-induced; Clinical governance; Review

Takayasu arteritis is a chronic progressive nonspecific inflammation of the aorta and its branches of unknown etiology that leads to stenosis or occlusion of various vascular segments. It is most common in young women under 40 years of age [1]. This condition results in inflammatory reactions, fibrosis, stenosis, and thrombosis, leading to loss of vascular wall integrity and aneurysm formation [2]. In clinical practice, women of childbearing age with Takayasu arteritis often have concerns about the adverse effects of the disease on fertility and fetal health [3].

Previous studies have reported that while pregnancy does not accelerate the progression of Takayasu arteritis, it does increase the risk of adverse pregnancy outcomes in women of childbearing age, including gestational hypertension, preterm labor, and intrauterine growth restriction [4]. A retrospective study in France indicated that during pregnancy, patients with Takayasu arteritis had an approximately 13-fold increased risk of experiencing pregnancy complications [5]. Currently, there is no consensus among rheumatologists, obstetricians, and other

relevant clinicians regarding the clinical management of patients with Takayasu arteritis during pregnancy. Therefore, this article aims to review the impact of Takayasu arteritis on reproductive, maternal, and fetal outcomes in women of childbearing age, utilizing “Takayasu arteritis” as a primary search term, and discuss related clinical management strategies.

1. Effects of Takayasu Arteritis on the Reproductive System

Takayasu arteritis affects the female reproductive organs and can lead to systemic vasculitis-related infertility. Potential mechanisms include vascular inflammation of the reproductive system, such as polyarteritis nodosa and necrotizing small- and medium-sized vasculitis, along with the formation of autoantibodies in placental tissue [6]. In an Italian cohort study, the pregnancy rate in patients with Takayasu arteritis decreased from 8.2% before disease onset to 2.8% after onset [7]. However, some studies have suggested that Takayasu arteritis may not be the primary cause of infertility [8]. In fact, women with Takayasu arteritis may have other contributing factors such as voluntary delay of pregnancy or concerns about potential pregnancy complications.

Overall, patients with Takayasu arteritis may experience infertility due to the disease itself, but they may also opt for abortion due to concerns about potential adverse effects of pregnancy complications. Therefore, it is crucial in clinical practice to engage in discussions about fertility planning with patients diagnosed with Takayasu arteritis. These patients should undergo obstetric consultations before pregnancy to assess disease activity, comorbidities, and general health condition. Since many medications used to treat Takayasu arteritis are teratogenic, clinicians should replace potentially harmful medications with safer alternatives to guide medication use during pregnancy. It is essential to ensure that patients with Takayasu arteritis are in stable condition before conception and that they receive regular monitoring and evaluation from both obstetricians and rheumatologists. Ideally, pregnancy should be planned when the disease is in sustained remission [9-10]. In conclusion, while numerous studies have examined the impact of Takayasu arteritis on fertility, most findings indicate that fertility outcomes are not significantly affected by the disease. The primary focus should be on managing pregnancy complications and controlling disease activity before conception to minimize adverse effects on both mother and fetus.

2. Interaction Between Takayasu Arteritis and Pregnancy

Increased circulating blood volume and cardiac load during pregnancy can exacerbate vascular lesions in Takayasu arteritis, leading to an elevated risk of vascular injury, stroke, and myocardial infarction [11]. The most frequently observed complication of pregnancy in patients with Takayasu arteritis is gestational hypertension, with an overall prevalence rate of approximately 54%. During this condition, there is a significantly heightened risk of aortic aneurysms and hem-

orrhagic strokes, posing a life-threatening danger to the mother. Hypertension during pregnancy has been linked to complications such as preterm labor, low birth weight, and maternal mortality [3]. Therefore, it is crucial to closely monitor blood pressure and administer appropriate treatment during pregnancy. In one study, patients with elevated blood pressure during pregnancy who received treatment with α -methyldopa experienced improved pregnancy outcomes [12].

The increased blood volume during pregnancy places a greater load on the heart, which can result in complications such as worsening aortic regurgitation, congestive heart failure, renal insufficiency, antepartum hemorrhage, pulmonary embolism, and ischemic heart disease [3-4]. If a cardiovascular event occurs, it can be fatal for pregnant women with Takayasu arteritis. Deaths related to Takayasu arteritis account for 5% to 19% of all maternal deaths [13-14]. Research suggests that active Takayasu arteritis before pregnancy is associated with pregnancy complications, and the risk of adverse pregnancy outcomes increases if Takayasu arteritis remains active during pregnancy [15]. Therefore, controlling the activity of Takayasu arteritis before and during pregnancy may reduce the incidence of adverse pregnancy outcomes.

It is worth noting that a recent review published in *Rheumatology International* identified late gestational hypertension, abdominal and renal vascular involvement, early gestational disease activity, and delayed medical care as predictors of poor prognosis in patients with Takayasu arteritis. Pregnancy complications are more common in patients with active Takayasu arteritis, which may predispose them to adverse pregnancy outcomes. The recommended methods for assessing the activity of Takayasu arteritis consist of four components: assessment of systemic features (presence or absence of other identified causes), assessment of erythrocyte sedimentation rate or C-reactive protein levels, assessment of manifestations of vascular ischemia or inflammation (such as limb claudication, diminished or absent pulsations, murmurs, large-vessel pain, or asymmetric blood pressure), and imaging (presence of new vascular lesions or absence of such lesions) [16]. Currently, there are no definitive studies on the immunologic profile of patients with Takayasu arteritis during pregnancy. A more comprehensive understanding of the effects of Takayasu arteritis on the immune system during pregnancy is needed to guide clinical management in the future.

In summary, pregnancy in patients with Takayasu arteritis requires careful consideration and aggressive evaluation. Multidisciplinary management, including controlling disease activity, treating gestational hypertension, and using relevant medications, is essential to improve pregnancy outcomes in patients with Takayasu arteritis.

3. Effects of Takayasu Arteritis on the Fetus

In patients with Takayasu arteritis, it is crucial to control disease activity before conception as studies have demonstrated a significant association between Takayasu arteritis activity and adverse pregnancy outcomes [17]. A study by

GUPTA et al. [18] discovered that Takayasu arteritis might lead to miscarriages in affected patients. The activity of Takayasu arteritis causes inflammatory reactions within the placenta, resulting in damage to various components, including syncytiotrophoblasts, intravascular trophoblasts, spiral vein endothelial cells, and superficial/glandular epithelial cells in the meconium. This damage impairs the implantation of fertilized ova and disrupts fetal perfusion [3-4]. Takayasu arteritis activity during pregnancy is also a significant contributor to gestational hypertension, which further influences adverse fetal outcomes. Patients with Takayasu arteritis, particularly those with involvement of two or more vascular lesions, exhibit a higher incidence of pregnancy complications [19-20]. The risk of pregnancy complications is three times higher in patients with active Takayasu arteritis, particularly during the middle and late stages of pregnancy [21]. Adverse outcomes such as intrauterine growth retardation, a higher rate of cesarean sections, preterm labor, and lower birth quality are more common in pregnancies of patients with Takayasu arteritis. These outcomes are associated with the duration of treatment, the severity of hypertension, and the degree of arterial involvement. Clinicians should actively inform patients about the adverse effects of Takayasu arteritis on the fetus and advise them to seek early medical care. Proper monitoring, management, and medication guidance are essential to avoid adverse outcomes and life-threatening risks to both the patient and fetus due to delayed medical care. Underestimating the risk to the life of both the patient and the fetus due to delayed medical care is not advisable.

4. Clinical Management of Takayasu Arteritis During Pregnancy

Due to the potential impact of treatment for severe vasculitis, it is important to consider the treatment of Takayasu arteritis when women become pregnant without a prior diagnosis of the condition. Effective control of Takayasu arteritis activity can greatly benefit the patient. Adequate perinatal surveillance and management are crucial to improving maternal and fetal outcomes, necessitating active patient cooperation and close collaboration among multidisciplinary physicians.

4.1 Pre-pregnancy Management

Pre-pregnancy counseling and risk assessment for complications are essential steps for women with Takayasu arteritis to achieve successful pregnancy outcomes. Takayasu arteritis can lead to stenosis of blood vessels, causing damage to organs. Achieving remission of vasculitis before pregnancy is a critical factor for a successful pregnancy. Vascular intervention is justified for severely stenotic arterial lesions, including the renal arteries, abdominal aorta, and carotid arteries, in patients with Takayasu arteritis [22].

Following the guidelines on prescribing medications during pregnancy and lactation proposed by the British Society for Rheumatology and the British Association

tion of Rheumatology Health Professionals, as well as the guidelines on reproductive health management of rheumatic and musculoskeletal disorders proposed by the American College of Rheumatology, it is recommended to switch from immunosuppressive agents to medications with a lower impact on pregnancy before conception. Management during the pre-pregnancy and prenatal stages should involve a multidisciplinary approach [23-24].

Patients with severe aortic valve disease, aortic aneurysms, chronic kidney disease, severe pulmonary hypertension, and congestive heart failure are at increased risk of maternal mortality [3-4]. Therefore, pregnancy in patients with these complications should be discouraged, and if pregnancy is unintended, prompt termination should be considered.

4.2 Antenatal Management

Antenatal evaluation of patients with Takayasu arteritis should include a detailed medical history and clinical examination, such as monitoring extremity blood pressure, pulse recordings, and changes in symptoms and signs, every 3 to 4 weeks until 28 weeks of gestation, and then twice a month until 37 weeks [10]. Additionally, fetal growth should be monitored through regular growth scans and fetal color Doppler ultrasonography at intervals of 4 weeks [25].

Diagnosing and monitoring Takayasu arteritis during pregnancy can be challenging, and angiography is not recommended due to the potential effects of contrast media and radiation on the fetus [26]. Color Doppler ultrasonography is an effective noninvasive method for assessing vasculitis by examining stenotic or occlusive lesions of the aorta and its major branches, such as the carotid, subclavian, or renal arteries [10]. Studies have indicated that pregnant patients with Takayasu arteritis and renal artery stenosis are more susceptible to adverse events, and intervention to treat stenotic renal arteries may prevent adverse fetal effects [27].

Blood pressure control is crucial during pregnancy, and safe medications such as labetalol hydrochloride, hydralazine hydrochloride, and methyldopa can be used [3-4]. In cases where blood pressure remains uncontrolled despite aggressive drug therapy, pregnancy termination may be necessary.

Immunosuppressive agents like steroids, azathioprine, or cyclosporine may be used to continue controlling Takayasu arteritis activity in pregnant patients. For patients on cyclosporine, regular blood pressure monitoring and assessment for conditions like upper extremity arterial occlusion are necessary. The guidelines for reproductive health management of rheumatic and musculoskeletal diseases proposed by the American College of Rheumatology suggest that tumor necrosis factor inhibitors can be used to control disease activity during pregnancy [24]. A longitudinal case study reported successful pregnancies in patients with Takayasu arteritis under treatment with interleukin 6 blockers (tocilizumab), demonstrating the potential of these agents to manage active Takayasu arteritis during pregnancy [28]. A case report also suggested that certolizumab may be

effective in achieving clinical remission of Takayasu arteritis in pregnant patients [29].

4.3 Perinatal Management

Pregnant patients with Takayasu arteritis experience significantly higher incremental blood pressure values during the first and second stages of labor compared to normal controls [30]. For patients with lesions involving the descending thoracic aorta, abdominal aorta, and renal arteries, cesarean section is more appropriate. For those with lesions involving the aortic arch and its branches, as well as the ascending aorta, full-term vaginal delivery may be attempted [9]. However, Takayasu arteritis patients with a substantial increase in blood pressure during the second stage of labor may be at risk of serious complications such as cerebral hemorrhage or vascular tearing of the aortic arch [30].

The use of epidural analgesia during labor can help prevent significant blood pressure fluctuations during the second stage of labor [31]. In clinical practice, forceps or vacuum aspiration may be considered to expedite the second stage of labor and prevent vascular-related complications [9]. When administering general anesthesia, it is essential to avoid high neck extension forces during intubation, as this could potentially compromise cerebral blood flow in patients with carotid artery involvement [32]. Ergonovine should also be avoided, as it can increase the risk of dyspnea or cyanosis in patients. On the other hand, oxytocin injections can help prevent postpartum hemorrhage. In a previous clinical study, 13 pregnant women with Takayasu arteritis underwent cesarean section due to severe hypertension [33]. Pregnant women with Takayasu arteritis are at risk for severe gestational hypertension, aortic coarctation, and aortic regurgitation during pregnancy, which should be aggressively managed to prevent complications.

5. Prospects

The overall prognosis for pregnant women with Takayasu arteritis is generally favorable, despite clinical reports of adverse pregnancy outcomes. Clinical outcomes can be significantly improved by effectively controlling disease activity before pregnancy and maintaining tight blood pressure control during pregnancy. While Takayasu arteritis tends to remain stable during pregnancy, it still necessitates vigilant monitoring. Although there is some suggestion that revascularization before pregnancy might be beneficial for patients with severe stenosis of vital organ vessels, there is currently insufficient clinical evidence to support this approach. Future high-quality clinical studies are needed to explore this possibility further. In conclusion, the management of Takayasu arteritis during pregnancy requires active cooperation from patients, close collaboration among multidisciplinary healthcare providers, and ongoing monitoring and care to achieve favorable pregnancy outcomes.

Author contributions: Liu Yinghong conceived and designed the article, con-

ducted the literature search, and wrote the article; Yang Xiaojuan was responsible for reviewing and proofreading the article and is responsible for the article as a whole; all authors confirmed the final draft of the paper.

Conflict of interest: There is no conflict of interest in this article.

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Note: Figure translations are in progress. See original paper for figures.

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