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Recommendations of the Turkish Society for Rheumatology on tuberculosis screening and treatment in patients receiving advanced antirheumatic drug therapy

Gelişmiş antiromatizmal ilaç tedavisi alacak hastalarda tüberküloz taraması ve tedavisi için Türkiye Romatoloji Derneği önerileri

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Abstract

Tuberculosis (TB) remains a significant public health concern in endemic countries despite widespread Bacillus Calmette-Guérin vaccination. In rheumatology practice, biologic and targeted synthetic disease-modifying anti-rheumatic drugs (b/tsDMARDs) alter immune responses and increase the risk of reactivation of latent TB infection or development of new TB. Therefore, appropriate screening, treatment, and follow-up strategies before, during, and after initiation of advanced therapies are essential. These recommendations were developed by the Tuberculosis Working Group of the Turkish Society for Rheumatology through a systematic literature review, an evaluation of national and international guidelines, and a Delphi consensus process involving 12 experts. The recommendations address key clinical questions, including the definition of latent TB, the interpretation of the tuberculin skin test and the interferon-gamma release assay, the selection and duration of treatment regimens, management during pregnancy and lactation, the approach to patients with prior TB, and the management of TB occurring during advanced therapies. Isoniazid is

Özet

Tüberküloz (TB), Bacillus Calmette-Guérin aşılamasına rağmen ülkemizde önemini koruyan bir halk sağlığı sorunudur. Romatolojik hastalıkların tedavisinde kullanılan biyolojik ve hedefe yönelik sentetik hastalık modifiye edici antiromatizmal ilaçlar (b/tsDMARD'ler), immün yanıtı baskılamaları nedeniyle latent tüberkülozun reaktivasyonu ve yeni TB gelişimi açısından ek risk oluşturur. Bu nedenle gelişmiş tedavi öncesinde, sırasında ve sonrasında uygun tarama, tedavi ve izlem stratejilerinin belirlenmesi kritik öneme sahiptir. Türkiye Romatoloji Derneği Tüberküloz Çalışma Grubu tarafından hazırlanan bu öneriler, sistematik literatür taraması, ulusal ve uluslararası kılavuzların incelenmesi ve 12 uzmanın katıldığı Delphi konsensus süreci ile oluşturulmuştur. Rehber; latent tüberküloz tanımı, tüberkülin deri testi ve interferon gamma salınım testlerinin kullanımı ve yorumlanması, latent tüberküloz tedavi rejimleri ve süreleri, gebelik ve emzirme döneminde yaklaşım, geçirilmiş TB öyküsü olan hastalarda izlem, gelişmiş tedavi altında TB gelişimi ve yeniden tedavi planlaması gibi başlıkları kapsamaktadır. Latent tüberküloz saptanan hastalarda öncelikli

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Abstract

recommended for nine months as the first-line treatment, with alternative options specified for particular clinical scenarios. The timing of advanced therapy initiation relative to latent TB treatment should be individualized based on disease activity and TB risk assessment. These recommendations aim to provide clinicians with a practical roadmap for latent and active TB screening and management in patients receiving b/tsDMARD treatments, and are consistent with national data.

Keywords: Latent tuberculosis, biologic therapy, bDMARD, tsDMARD, anti-TNF, IGRA, tuberculin skin test, rheumatic diseases, Delphi consensus

Özet

latent tüberküloz tedavi rejimi izoniazid 9 ay olarak önerilmiş, alternatif şemalar tanımlanmıştır. Latent tüberküloz tedavisi ve gelişmiş tedavilerin zamanlamasının hastalık aktivitesine göre planlanması önerilmiştir. Bu rehber ile, b/tsDMARD tedavilerinde latent ve aktif TB tarama ve yönetimi hakkında klinisyenlere pratik ve ulusal verilerle uyumlu bir yol haritası sunulması amaçlanmıştır.

Anahtar Kelimeler: Latent tüberküloz, biyolojik tedavi, bDMARD, tsDMARD, anti-TNF, IGRA, tüberkülin deri testi, romatolojik hastalıklar, Delphi konsensus

Introduction

Tuberculosis (TB) remains an important public health problem in countries where it shows endemic characteristics despite Bacillus Calmette-Guérin (BCG) vaccination.[1] Advanced therapies used in the treatment of rheumatologic diseases, namely biologic and targeted synthetic disease-modifying anti-rheumatic drugs (bDMARDs and tsDMARDs), may create an additional risk for the development of TB or reactivation of latent TB infection due to their effects on the immune response.[2] Therefore, it is essential to define appropriate screening, adequate treatment for latent TB, and safe follow-up strategies before, during, and after advanced therapy.

On behalf of the Turkish Society for Rheumatology (TSR), the Tuberculosis Working Group planned to develop practical and applicable recommendations that are consistent with scientific evidence and national real-life data, while taking into account the conditions of Türkiye, to address clinical problems frequently encountered in rheumatology practice related to TB. The aim in developing these recommendations is to provide up-to-date, consistent, and practical information on latent TB screening, definitions, and treatment approaches for patients who will receive b/tsDMARD agents. In addition, it is intended to create a guide to assist clinicians in (a) the follow-up of patients receiving b/tsDMARD therapy with respect to TB risk, and (b) the determination of treatment strategies for patients diagnosed with latent or active TB.

Materials and Methods

Study Group

These recommendations were developed with participation from members of the "Tuberculosis Working Group" established by the TSR. Twelve rheumatology specialists participated in the group. All participants declared potential conflicts of interest. This study is based on a systematic literature review and expert opinion; it does not include patient or public participation.

Development of Clinical Questions

Thirteen research questions were identified concerning TB-related issues that are frequently encountered and difficult to resolve in rheumatology practice. These questions cover focus areas such as latent TB screening, interpretation of the tuberculin skin test (TST) or interferon-gamma release assay (IGRA), duration of latent TB treatment and drug selection, approach during pregnancy and lactation, follow-up of patients with a history of TB, and the interaction between advanced therapies and TB. To structure clinical decision-making, all guideline questions were addressed using the PICO system.

The PICO questions that need to be answered regarding TB in rheumatology practice are listed below:

Question 1: What is the definition of latent TB?

Question 2: What are the screening methods? Which of the TST, IGRA, chest radiography should be used? Which should be chosen: TST or IGRA test? What are the advantages over each other?

Question 3: What should be the TST cut-off value for the definition of latent TB?

Question 4: Latent TB treatment: which drug should be used and for how long?

Question 5: What should be the screening and latent TB treatment approach in pregnant and breastfeeding women?

Question 6: What is the duration of protection in patients receiving treatment for latent TB? Is repeat treatment necessary; after how many years should it be repeated?

Question 7: How should screening be performed in patients receiving immunosuppressive drugs?

Question 8: If b/tsDMARD therapies are to be initiated in patients who have previously had TB, how should TB screening and treatment be performed?

Question 9: In patients receiving b/tsDMARD therapy, how frequently and how should patients be screened in terms of TB frequency and development?

Question 10: In patients who develop TB under b/tsDMARD therapy, how should anti-TB treatment be managed, and if advanced therapy is to be restarted, what should be the timing and drug selection?

Question 11: In patients who have received TB treatment or completed latent TB treatment, what should be the follow-up protocol and screening approach?

Question 12: After initiating latent TB treatment, when can b/tsDMARD therapies be started, and can latent TB treatment and b/tsDMARD therapies be given simultaneously?

Question 13: Is there a difference between drugs in terms of TB development risk in b/tsDMARD therapies?

Literature Search

In line with the defined questions, a systematic search was conducted in PubMed, Scopus, and Web of Science, and national guidelines, international recommendations, and real-life data were reviewed.

Delphi Consensus Process

For each PICO question, draft recommendations were prepared by combining evidence from the literature with experts' experience. All group members expressed their opinions on the draft recommendations, which were then finalized. The recommendations were submitted to Delphi voting within the group and scored using a Likert scale (1: strongly disagree - 5: strongly agree). The level of agreement for each recommendation was provided.

Recommendations

This section presents the recommendations and summaries that the working group developed and agreed upon by combining the systematic literature review conducted within the scope of the research questions with expert opinions.

1. What is the Definition of Latent TB?

Recommendation 1: It is defined as cases without clinical complaints or findings related to TB, having positive IGRA or TST results indicating prior encounter with the TB bacillus, typically having normal chest radiographs, or, in those with abnormal chest radiographs, cases in whom active TB has been excluded by appropriate methods (agreement score: 5.0).[1,2]

2. Recommendations for Latent TB Screening

2.1. How should patients be screened for latent TB before receiving advanced therapy?

Recommendation 2: For latent TB screening, TST or IGRA testing should be performed in addition to chest radiography (agreement score: 5.0).[3-6]

2.2. Which test should be preferred in latent TB screening?

Recommendation 3: TST or IGRA may be preferred in latent TB screening, and there is no drawback in using either of them; however, if available, IGRA should be preferred (agreement score: 5.0).[7-14]

IGRA should be preferred in latent TB screening because it shows high specificity and sensitivity and is less affected by BCG vaccination.[5,6,15-22]

2.3. What should be the approach according to the TST result before advanced therapy?

Recommendation 4: When TST is preferred as the first test in latent TB screening, induration of 5 mm and above is accepted as positive and treatment for latent TB is given (agreement score: 4.83).[23-25]

Recommendation 5: In cases with induration below 5 mm, IGRA or repeat TST (booster) after 1-3 weeks is recommended (agreement score: 4.83).[24-26]

2.4. When should screening tests be repeated in patients with negative TST and/or IGRA before advanced therapy?

Recommendation 6: In high-risk patients receiving bDMARD or tsDMARD therapy whose initial screening TST or IGRA is negative, repeat latent TB screening is recommended after the first year following physician evaluation (agreement score: 4.92).[27-31]

2.5. What should be done in patients found to have a positive follow-up screening test?

Recommendation 7: If positivity is detected in the repeated test, latent TB treatment should be given (agreement score: 4.92).[19,32,33]

Recommendation 8: It is appropriate that screening be performed primarily with IGRA blood tests, and if access is not available, by using TST (agreement score: 5.0).[27-31]

2.6. How should patients with unclear treatment information for latent TB or previous active TB be approached?

Recommendation 9: In patients with positive TB screening tests whose treatment history for latent TB is unclear or who have not received treatment, with no findings of active TB infection at the current visit, a standard latent TB treatment regimen should be planned by approaching them as if latent TB were present (agreement score: 4.83).

3. Drug Options and Duration of use for Latent TB Treatment

3.1. Which drug should be used for latent tb treatment and for how long? What should be the priority of isoniazid (INH), rifampicin (RIF), pyrazinamide (PRZ), and ethambutol (ETB) options in treatment?

Recommendation 10: For latent TB treatment, INH monotherapy should be given as the first option at a dose of 300 mg/day for 9 months (agreement score: 4.92).[3,34-37]

Recommendation 11: Even if the advanced antirheumatic agent is discontinued, if latent TB treatment has been started, it should be completed if possible (agreement score: 5.0).[37]

As long as they are receiving INH, neuropathy prophylaxis with pyridoxine supplementation is recommended for patients (agreement score: 4.83).

3.2. What should be the alternatives, drug combinations, and recommended duration in patients who cannot receive INH?

Recommendation 12: In patients who cannot use INH, the first alternative should be RIF 600 mg/day as a treatment for 4 months treatment (agreement score: 4.92).[3,34,36-39]

Recommendation 13: Alternatively, the combination of RIF 600 mg + INH 300 mg for 3 or 4 months, INH 900 mg once weekly and rifapentine 900 mg once weekly as a 3 months combination, daily combination of RIF and PRZ for 2 months with attention to hepatotoxicity, or the combination of levofloxacin (1000 mg/day) or moxifloxacin (400 mg/day) with ETB (2000 mg/day) or ethionamide (750 mg/day) for 6 months may be given (agreement score: 4.92).[3,27,34,36,37,39-46]

4. How Should Screening be Performed When Advanced Antirheumatic Therapy Will be Initiated in Patients Who Have Had TB?

Recommendation 14: In patients who have previously had TB, tests such as TST and IGRA are not appropriate for screening; screening for active TB should be performed using clinical, laboratory, and imaging methods (agreement score: 5.0).[37]

5. Follow-up Recommendations in Patients Who Have Received Latent TB Treatment

5.1. For how long is this treatment considered protective in patients who have received latent TB treatment?

Recommendation 15: Those who complete INH monotherapy for 6 months are considered protected for 7 years; those who complete 9 months are considered protected for 10 years; and those who complete uninterrupted TB treatment of appropriate duration according to organ involvement are considered protected for 10 years (agreement score: 4.92).[47-53]

Recommendation 16: In patients who have completed latent TB treatment, protection has been shown to continue for more than 10 years, and there are no data regarding the administration of repeat treatment (agreement score: 4.92).[54]

Recommendation 17: Re-treatment is recommended in individuals who are approaching the end of the specified periods and who are in high socioeconomic-risk conditions/high-risk populations for TB contact/activation (high-risk population: if there is an active TB case in the immediate environment such as home or workplace, history of imprisonment, substance use, military barracks living, daily use of public transportation...) (agreement score: 4.83).[37]

Recommendation 18: Advanced therapy may be started directly in patients with a history of completed TB treatment within 10 years (the durations given above) and without findings suggestive of TB infection (agreement score: 4.92).[54,55]

5.2. How should the adequacy and effectiveness of treatment given for latent TB be evaluated?

Recommendation 19: Whether TB treatment has been received appropriately, uninterruptedly, and for a sufficient duration should be verified with TB Dispensary records and patient documents (agreement score: 4.83).[37]

5.3. When can bDMARD or tsDMARD therapy be started after initiating latent TB treatment?

Recommendation 20: In patients in whom latent TB is detected and treatment for it is started, bDMARD or tsDMARD should be started 4 weeks later if rheumatologic disease activity permits (agreement score: 4.92).[32,34,36,37,56]

5.4. Can latent TB treatment and bDMARD or tsDMARD therapy be given simultaneously?

Recommendation 21: If there is severe rheumatologic disease activity, bDMARD or tsDMARD therapy may also be started together with latent TB treatment without waiting 4 weeks; however, close follow-up with clinical, laboratory, and when necessary imaging is recommended in terms of TB development (agreement score: 5.0).[28,34,57]

Recommendation 22: According to real-life data from Türkiye, since no TB flare was observed in patients in whom latent TB treatment and b/tsDMARD were started simultaneously, latent TB treatment and advanced therapies may be started simultaneously in patients with severe rheumatologic activity and in whom active TB infection has been shown to be absent (agreement score: 4.92).

6. Is There a Difference Between bDMARD or tsDMARDs in Terms of the Risk of TB Development?

Recommendation 23: Among biologic drugs, the risk of TB development is higher in the anti-tumour necrosis factor-α (TNF-α) drug group than in non-anti-TNF-α drugs (agreement score: 4.92).[28,29,31,58,59]

Recommendation 24: Within the anti-TNF-α class, the risk of TB development under chimeric (infliximab), monoclonal antibody (adalimumab, golimumab), and pegylated anti-TNF-α

(certolizumab) treatment is higher than with the TNF-α receptor fusion protein (etanercept) (agreement score: 4.92).[28,30,38,60-62]

Recommendation 25: Among drugs outside the anti-TNF-α group, the risk of TB development from highest to lowest is as follows: Janus kinase inhibitors (tsDMARD group drugs: tofacitinib, baricitinib, upadacitinib), interleukin-6 (IL-6) antagonists (tocilizumab, sarilimumab, calakizumab), cytotoxic T-lymphocyte associated protein 4 (CTLA-4) inhibitor (abatacept), IL-1 antagonists (anakinra and canakinumab), anti-CD-20 (rituximab), anti-IL-17 (ixekizumab, secukinumab), rituximab, anti-IL-17 (ixekizumab, secukinumab), ustekinumab, and IL-23 inhibitors (guselkumab, risankizumab) (agreement score: 4.75).[2,28,63-83]

7. Active TB Evaluation and Management

7.1. How should patients be approached if there is suspicion of active TB?

Recommendation 26: The presence of active TB clinical findings should be investigated with imaging, clinical, and laboratory examinations (agreement score: 5.0).[3]

Recommendation 27: If there is suspicion of active TB in patients receiving bDMARD or tsDMARD therapies, advanced therapies should be discontinued until the investigations are completed (agreement score: 4.92).[3]

Recommendation 28: If there is active disease, the patient should be evaluated with the relevant specialties in order to restart TB treatment, and advanced therapy should not be given until TB is controlled (agreement score: 4.92).[84]

7.2. In patients who develop TB while receiving bDMARD or tsDMARD drug treatment, how should anti-TB treatment be managed; if bDMARD and tsDMARD therapies are to be restarted, what should be the timing and drug selection?

Recommendation 29: In patients who develop TB under bDMARD or tsDMARD drug treatment, anti-TB treatment is initiated in accordance with the National Tuberculosis Diagnosis and Treatment Guideline (agreement score: 5).[3,34,37]

Recommendation 30: If advanced therapy is to be restarted in patients who develop TB, completion of TB treatment is recommended first. In patients with high disease activity, b/tsDMARD agents may be given at the earliest 2 months after TB treatment has been started (agreement score: 4.92).[27,85]

7.3. How should antirheumatic drug selection be made in patients who develop TB under bDMARD and tsDMARD therapies?

Recommendation 31: Drugs carrying a lower risk in terms of TB reactivation should be preferred in patients. Monoclonal anti-TNF antibodies are associated with a higher risk of TB than receptor fusion proteins. The TB risk associated with tocilizumab (anti-IL-6), abatacept, ustekinumab, secukinumab, apremilast, and rituximab is lower compared with anti-TNF group drugs (agreement score: 5).[2,66,86-92]

8. What Should be the Long-term Follow-up Protocol, Screening, and Re-treatment Approach in Those Who Complete TB Infection or Latent TB Treatment?

Recommendation 32: In those who complete TB infection treatment or latent TB treatment, follow-up with physical examination every 3 months and, if necessary, further evaluation directed to the affected system is recommended. In these patients, TST and IGRA are not recommended because they do not assist in diagnosis. TB activity should be sought according to clinical, laboratory, and imaging methods (agreement score: 4.75).[37,66]

Recommendation 33: If active TB is detected, anti-TB treatment is given. If active disease has not been detected but there is a suspicious situation in terms of previous treatment and re-infection, the patient should be re-evaluated by the relevant specialist in terms of preventive treatment (agreement score: 4.92).[37]

9. Recommendations for Special Groups

9.1. How should latent TB screening be performed in pregnant women?

Recommendation 34: TST and IGRA tests are safe for latent TB screening in pregnant women, and both methods may be used (agreement score: 4.83).[26,93-95]

9.2. How should latent TB treatment be performed in pregnant women?

Recommendation 35: In pregnant women diagnosed with latent TB and planned to receive bDMARD treatment, INH treatment for 9 months is the first choice for treatment. These patients should be followed closely in terms of hepatotoxicity risk, and daily 25-50 mg pyridoxine prophylaxis is recommended due to the risk of peripheral neuropathy (agreement score: 4.92).[96-100]

Recommendation 36: In pregnant women who cannot use INH, RIF treatment may be used as an alternative.[97,99,101] Administration of vitamin K at birth is recommended for newborns exposed to RIF during pregnancy because of the risk of "hemorrhagic disease of the newborn" (agreement score: 4.92).[102-104]

9.3. How should latent TB screening be performed in breastfeeding mothers?

Recommendation 37: In breastfeeding patients, TST or IGRA tests may be used for latent TB screening similarly to the normal population (agreement score: 4.92).

9.4. How should latent TB treatment be performed in breastfeeding mothers?

Recommendation 38: In breastfeeding patients with latent TB detected and planned to receive bDMARD treatment, use of INH for 9 months should be preferred as the first choice for treatment.[105,106] During treatment, use of pyridoxine prophylaxis is recommended for both the mother and the infant (agreement score: 4.92).[107]

Recommendation 39: In breastfeeding patients in whom use of INH is not appropriate, RIF treatment may be preferred as an alternative (agreement score: 4.92).[108,109]

Discussion

This set of recommendations was prepared to guide clinicians in assessing TB-related risks, performing appropriate screening, and determining treatment protocols for patients for whom b/tsDMARD therapy is planned or who have already started these treatments. Türkiye's conditions regarding TB were considered, and recommendations were developed by combining evidence from the literature with approximately twenty-five years of experience in the use of biologic agents. Overall, the mean agreement scores for the recommendations are high. The application of the recommendations to each patient is possible only if the individual and medical characteristics of the patient are taken into account, and the preference of the clinician following the patient should take priority.

In Türkiye, the Ministry of Health's Tuberculosis Diagnosis and Treatment Guideline is updated periodically. The most recent update was made in 2019.[37] The TB guideline for patients using biologic agents was prepared in 2016 to include only anti-TNF drugs.[110] The guideline published in 2016 was prepared with relatively limited clinical experience, based only on anti-TNF drugs, and reflected the opinions and recommendations of chest diseases and TB specialists interested in TB rather than rheumatology specialists. Over the past ten years, the diversity of bDMARDs has increased, tsDMARDs have become widely used, and new scientific evidence regarding TB data in patients using these agents has been published in many sources, including registries. In this set of recommendations, those related to anti-TNF agents (infliximab, adalimumab, golimumab, certolizumab, and etanercept) were updated, and the recommendations were also expanded to include other bDMARDs such as IL-6 antagonists (tocilizumab, sarilimumab, calakizumab), the CTLA-4 inhibitor (abatacept), IL-1 antagonists (anakinra and canakinumab), anti-CD-20 (rituximab), anti-IL-17 (ixekizumab, secukinumab), IL-23 and 12/23 inhibitors (guselkumab, risankizumab, ustekinumab), and Janus kinase inhibitors in the tsDMARD category (tofacitinib, baricitinib, upadacitinib). In the guideline published in 2016, TST and IGRA were considered to have similar effectiveness for latent TB screening, and the preferential use of IGRA was recommended only for patients with psoriasis. In our study, IGRA tests were prioritized, when available, before all b/tsDMARDs because they show high specificity and sensitivity in latent TB screening and are less affected by BCG vaccination. In addition, recommendations were presented regarding TB screening, treatment, and bDMARD use in special situations such as pregnancy and lactation.

European Alliance of Associations for Rheumatology (EULAR) and American College of Rheumatology (ACR), the largest professional organizations in the field of rheumatology, publish guidelines on many issues, including diagnosis, treatment, and associated conditions of rheumatic diseases. These organizations have also provided recommendations on TB at different times. In 2022, EULAR presented recommendations for screening and prophylactic treatment for chronic and opportunistic infections including TB.[3,34] In this set of recommendations, the primary emphasis regarding TB is to follow national guidelines because of differences in BCG vaccination, TB burden, and drug resistance. ACR's approach, on the other hand, has been to implement Centers for Disease Control and Prevention (CDC) and American Thoracic Society (ATS) recommendations. ATS and CDC recommendations were developed based on TB data in the United States of America.[111] Our recommendations were also prepared to guide physicians in Türkiye, based on TB data in Türkiye, BCG vaccination, and clinical experience. National TB data may change over time. Therefore, the National Tuberculosis Guideline, published and revised over the years by the Republic of Türkiye Ministry of Health, Turkish Public Health Institution, should be followed, and updates to the recommendations should be considered when necessary.

The use of drugs that increase the risk of TB and TB activation or reactivation is not solely of interest to rheumatology specialists. However, rheumatology is the specialty that uses b/tsDMARDs most widely, for the longest time, and with the greatest experience. Gastroenterology, dermatology, and ophthalmology, which are involved in the treatment of diseases with inflammation-based pathogenesis, have an undeniable interest in this subject. Although prepared by a working group composed solely of rheumatology specialists, these recommendations will guide the management of latent and active TB in other specialties that use b/tsDMARDs as much as in rheumatology. One of the most important limitations of this set of recommendations is that chest and infectious disease

specialists experienced in TB management and representatives from other scientific fields experienced in the use of b/tsDMARDs were not included in the working group. It is our hope that a national consensus report will be prepared by a working group formed with participation from all parties involved.

Conclusion

In conclusion, this set of recommendations was prepared as a guiding source on TB screening and treatment for clinicians managing patients receiving bDMARD and tsDMARD agents in Türkiye.

Footnotes

Author Contributions

Concept: C.B., R.D., M.E., U.İ., B.İ., Z.Ö., Ş.Ç.S., M.S., V.Y., Ş.E., T.K., İ.E., Design: C.B., R.D., M.E., U.İ., B.İ., Z.Ö., Ş.Ç.S., M.S., V.Y., Ş.E., T.K., İ.E., Data Collection and Processing: C.B., R.D., M.E., U.İ., B.İ., Z.Ö., Ş.Ç.S., M.S., V.Y., Ş.E., T.K., İ.E., Analysis or Interpretation: C.B., R.D., M.E., U.İ., B.İ., Z.Ö., Ş.Ç.S., M.S., V.Y., Ş.E., T.K., İ.E., Literature Search: C.B., R.D., M.E., U.İ., B.İ., Z.Ö., Ş.Ç.S., M.S., V.Y., Ş.E., T.K., İ.E., Writing: C.B., R.D., M.E., U.İ., B.İ., Z.Ö., Ş.Ç.S., M.S., V.Y., Ş.E., T.K., İ.E.

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References

1. Centers for Disease Control and Prevention. About active tuberculosis disease [Internet]. Atlanta: Centers for Disease Control and Prevention; 2024. Available from: https://www.cdc.gov/tb/about/active-tuberculosis-disease.html
2. Evangelatos G, Koulouri V, Iliopoulos A, Fragoulis GE. Tuberculosis and targeted synthetic or biologic DMARDs, beyond tumor necrosis factor inhibitors. Ther Adv Musculoskelet Dis. 2020;12:1759720X20930116.
3. Fragoulis GE, Dey M, Zhao S, et al. Systematic literature review informing the 2022 EULAR recommendations for screening and prophylaxis of chronic and opportunistic infections in adults with autoimmune inflammatory rheumatic diseases. RMD Open. 2022;8:e002726.
4. Gualano G, Mencarini P, Lauria FN, et al. Tuberculin skin test - outdated or still useful for latent TB infection screening? Int J Infect Dis. 2019;80S:S20-2.
5. Pai M, Zwerling A, Menzies D. Systematic review: T-cell-based assays for the diagnosis of latent tuberculosis infection: an update. Ann Intern Med. 2008;149:177-84.
6. Uzorka JW, Wallinga J, Kroft LJM, Ottenhoff THM, Arend SM. Radiological signs of latent tuberculosis on chest radiography: a systematic review and meta-analysis. Open Forum Infect Dis. 2019;6:ofz313.
7. Auguste P, Tsertsvadze A, Pink J, et al. Comparing interferon-gamma release assays with tuberculin skin test for identifying latent tuberculosis infection that progresses to active tuberculosis: systematic review and meta-analysis. BMC Infect Dis. 2017;17:200.
8. Diel R, Goletti D, Ferrara G, et al. Interferon-γ release assays for the diagnosis of latent Mycobacterium tuberculosis infection: a systematic review and meta-analysis. Eur Respir J. 2011;37:88-99. Erratum in: Eur Respir J. 2012;39:793.
9. Lalvani A, Millington KA. Screening for tuberculosis infection prior to initiation of anti-TNF therapy. Autoimmun Rev. 2008;8:147-52.
10. Lee JH, Sohn HS, Chun JH, et al. Poor agreement between QuantiFERON-TB Gold test and tuberculin skin test results for the diagnosis of latent tuberculosis infection in rheumatoid arthritis patients and healthy controls. Korean J Intern Med. 2014;29:76-84.
11. Mancuso JD, Mazurek GH, Tribble D, et al. Discordance among commercially available diagnostics for latent tuberculosis infection. Am J Respir Crit Care Med. 2012;185:427-34.
12. Oh CE, Ortiz-Brizuela E, Bastos ML, Menzies D. Comparing the diagnostic performance of QuantiFERON-TB Gold plus to other tests of latent tuberculosis infection: a systematic review and meta-analysis. Clin Infect Dis. 2021;73:e1116-25.
13. Pang YK. Close contact investigation of TB in high-burden, low- and middle-income countries. Malays Fam Physician. 2014;9:11-7.
14. Shleider Carnero Canales C, Marquez Cazorla J, Furtado Torres AH, et al. Advances in diagnostics and drug discovery against resistant and latent tuberculosis infection. Pharmaceutics. 2023;15:2409.
15. World Health Organization. WHO consolidated guidelines on tuberculosis: module 4: treatment: drug-resistant tuberculosis treatment [Internet]. Geneva: World Health Organization; 2020. Available from: https://www.who.int/publications/i/item/9789240007048
16. European Centre for Disease Prevention and Control. 2018. Available from: https://www.ecdc.europa.eu/en
17. Carranza C, Pedraza-Sanchez S, de Oyarzabal-Mendez E, Torres M. Diagnosis for latent tuberculosis infection: new alternatives. Front Immunol. 2020;11:2006.
18. Goletti D, Delogu G, Matteelli A, Migliori GB. The role of IGRA in the diagnosis of tuberculosis infection, differentiating from active tuberculosis, and decision making for initiating treatment or preventive therapy of tuberculosis infection. Int J Infect Dis. 2022;124(Suppl 1):S12-9.
19. Kim HW, Kwon OC, Han SH, Park MC. Positive conversion of interferon-γ release assay in patients with rheumatic diseases treated with biologics. Rheumatol Int. 2020;40:471-9.
20. Lagrange PH, Thangaraj SK, Dayal R, et al. A toolbox for tuberculosis (TB) diagnosis: an Indian multi-centric study (2006-2008); evaluation of serological assays based on PGL-Tb1 and ESAT-6/CFP10 antigens for TB diagnosis. PLoS One. 2014;9:e96367.
21. Scholman T, Straub M, Sotgiu G, et al. Superior sensitivity of ex vivo IFN-γ release assays as compared to skin testing in immunocompromised patients. Am J Transplant. 2015;15:2616-24.
22. Zhang Y, Zhou G, Shi W, et al. Comparing the diagnostic performance of QuantiFERON-TB Gold Plus with QFT-GIT, T-SPOT.TB and TST: a systematic review and meta-analysis. BMC Infect Dis. 2023;23:40.
23. Targeted tuberculin testing and treatment of latent tuberculosis infection. This official statement of the American Thoracic Society was adopted by the ATS Board of Directors, July 1999. This is a Joint Statement of the American Thoracic Society (ATS) and the Centers for Disease Control and Prevention (CDC). This statement was endorsed by the Council of the Infectious Diseases Society of America. (IDSA), September 1999, and the sections of this statement. Am J Respir Crit Care Med. 2000;161:S221-47.
24. Jung YJ, Woo HI, Jeon K, et al. The significance of sensitive interferon gamma release assays for diagnosis of latent tuberculosis infection in

patients receiving tumor necrosis factor-α antagonist therapy. PLoS One. 2015;10:e0141033.

25. Pai M, Behr M. Latent mycobacterium tuberculosis infection and interferon-gamma release assays. Microbiol Spectr. 2016;4.

26. Centers for Disease Control and Prevention. Self-study modules on tuberculosis: module 3: targeted testing and the diagnosis of latent tuberculosis infection and tuberculosis disease. Atlanta: Centers for Disease Control and Prevention; 2019. Available from: https://www.cdc.gov/tb/media/pdfs/Self_Study_Module_3_Testing_and_Diagnosis_of_Latent_TB_Infection_and_TB_Disease.pdf

27. Cantini F, Nannini C, Niccoli L, et al.; SAFEBIO (Italian multidisciplinary task force for screening of tuberculosis before and during biologic therapy). Guidance for the management of patients with latent tuberculosis infection requiring biologic therapy in rheumatology and dermatology clinical practice. Autoimmun Rev. 2015;14:503-9.

28. Dobler CC. Biologic agents and tuberculosis. Microbiol Spectr. 2016;4.

29. Emer JJ, Frankel A, Zeichner JA. A practical approach to monitoring patients on biological agents for the treatment of psoriasis. J Clin Aesthet Dermatol. 2010;3:20-6.

30. Agarwal SK. Biologic agents in rheumatoid arthritis: an update for managed care professionals. J Manag Care Pharm. 2011;17(9 Suppl B):S14-8.

31. Chen DY, Shen GH, Chen YM, Chen HH, Hsieh CW, Lan JL. Biphasic emergence of active tuberculosis in rheumatoid arthritis patients receiving TNFα inhibitors: the utility of IFNγ assay. Ann Rheum Dis. 2012;71:231-7.

32. Singh JA, Saag KG, Bridges SL Jr, et al. 2015 American College of Rheumatology Guideline for the treatment of rheumatoid arthritis. Arthritis Rheumatol. 2016;68:1-26.

33. Son CN, Jun JB, Kim JH, Sung IH, Yoo DH, Kim TH. Follow-up testing of interferon-gamma release assays are useful in ankylosing spondylitis patients receiving anti-tumor necrosis factor alpha for latent tuberculosis infection. J Korean Med Sci. 2014;29:1090-3.

34. Fragoulis GE, Nikiphorou E, Dey M, et al. 2022 EULAR recommendations for screening and prophylaxis of chronic and opportunistic infections in adults with autoimmune inflammatory rheumatic diseases. Ann Rheum Dis. 2023;82:742-53.

35. Goletti D, Petrone L, Ippolito G, Niccoli L, Nannini C, Cantini F. Preventive therapy for tuberculosis in rheumatological patients undergoing therapy with biological drugs. Expert Rev Anti Infect Ther. 2018;16:501-12.

36. Iannone F, Cantini F, Lapadula G. Diagnosis of latent tuberculosis and prevention of reactivation in rheumatic patients receiving biologic therapy: international recommendations. J Rheumatol Suppl. 2014;91:41-6.

37. T.C. Sağlık Bakanlığı. Tüberküloz tanı ve tedavi rehberi. Ankara: T.C. Sağlık Bakanlığı; 2019. Yayın No: 1129. Erişim linki: https://hsgm.saglik.gov.tr/depo/birimler/tuberkuloz-db/Dokumanlar/Rehberler/Tuberkuloz_Tani_ve_Tedavi_Rehberi.pdf

38. Cantini F, Lubrano E, Marchesoni A, et al. Latent tuberculosis infection detection and active tuberculosis prevention in patients receiving anti-TNF therapy: an Italian nationwide survey. Int J Rheum Dis. 2016;19:799-805.

39. Petruccioli E, Petrone L, Chiacchio T, et al. Mycobacterium tuberculosis immune response in patients with immune-mediated ınflammatory disease. Front Immunol. 2021;12:716857.

40. World Health Organization. Latent tuberculosis infection: updated and consolidated guidelines for programmatic management. Geneva: World Health Organization; 2018. Available from: https://www.who.int/publications/i/item/9789241550239

41. Ruan QL, Huang XT, Yang QL, et al. Efficacy and safety of weekly rifapentine and isoniazid for tuberculosis prevention in Chinese silicosis patients: a randomized controlled trial. Clin Microbiol Infect. 2010;28:239-244.

42. Anton C, Machado FD, Ramirez JMA, et al. Latent tuberculosis infection in patients with rheumatic diseases. J Bras Pneumol. 2019;45:e20190023.

43. Camacho A, Pérez-Camacho I, Rivero A, et al. [Use of rifampicin plus pyrazinamide for antituberculosis prophylaxis does not increase the risk of severe hepatotoxicity in HIV patients: meta-analysis of randomized controlled clinical trials]. Enferm Infecc Microbiol Clin. 2010;28:239-44.

44. Torre-Cisneros J, San-Juan R, Rosso-Fernández CM, et al. Tuberculosis prophylaxis with levofloxacin in liver transplant patients is associated with a high incidence of tenosynovitis: safety analysis of a multicenter randomized trial. Clin Infect Dis. 2015;60:1642-9.

45. Malik AA, Becerra MC, Lash TL, et al. Risk factors for adverse events in household contacts prescribed preventive treatment for drug-resistant tuberculosis exposure. Clin Infect Dis. 2021;72:1709-15.

46. Marks SM, Mase SR, Morris SB. Systematic review, meta-analysis, and cost-effectiveness of treatment of latent tuberculosis to reduce progression to multidrug-resistant tuberculosis. Clin Infect Dis. 2017;64:1670-7. Erratum in: Clin Infect Dis. 2017;65:1433-4.

47. A double-blind placebo-controlled clinical trial of three antituberculosis chemoprophylaxis regimens in patients with silicosis in Hong Kong. Hong Kong Chest Service/Tuberculosis Research Centre, Madras/British Medical Research Council. Am Rev Respir Dis. 1992;145:36-41.

48. Fornaro M, Stano S, Goletti D, et al. Prevalence and management of tuberculosis infection in Apulian rheumatologic patients treated with biologics: an observational cohort 10-year study from the BIOPURE registry. Eur J Clin Invest. 2023;53:e13913.

49. Golub JE, Cohn S, Saraceni V, et al. Long-term protection from isoniazid preventive therapy for tuberculosis in HIV-infected patients in a medium-burden tuberculosis setting: the TB/HIV in Rio (THRio) study. Clin Infect Dis. 2015;60:639-45.

50. Huang SF, Chen MH, Wang FD, Tsai CY, Fung CP, Su WJ. Efficacy of isoniazid salvage therapy for latent tuberculosis infection in patients with immune-mediated inflammatory disorders - a retrospective cohort study in Taiwan. J Microbiol Immunol Infect. 2018;51:784-93.

51. Kwon M, Sung M, Kwon YJ, et al. Active tuberculosis risk with tumor necrosis factor inhibitors after treating latent tuberculosis. J Clin Rheumatol. 2014;20:68-73.

52. Song YJ, Cho SK, Kim H, et al. Risk of tuberculosis development in patients with rheumatoid arthritis receiving targeted therapy: a prospective single center cohort study. J Korean Med Sci. 2021;36:e70.

53. Teixeira LAA, Santos B, Correia MG, et al. Long-term protective effect of tuberculosis preventive therapy in a medium/high tuberculosis incidence setting. Clin Infect Dis. 2024;78:1321-7.

54. Jo KW, Hong Y, Jung YJ, et al. Incidence of tuberculosis among anti-tumor necrosis factor users in patients with a previous history of tuberculosis. Respir Med. 2013;107:1797-802.

55. Ozguler Y, Hatemi G, Ugurlu S, et al. Re-initiation of biologics after the development of tuberculosis under anti-TNF therapy. Rheumatol Int. 2016;36:1719-25.

56. Dobler CC. Biological agents and tuberculosis: risk estimates and screening strategies. Int J Rheum Dis. 2015;18:264-7.

57. Ramos JF, Batista MV, Costa SF. Tuberculosis in hematopoietic stem cell transplant recipients. Mediterr J Hematol Infect Dis. 2013;5:e2013061.

58. Keane J. Tumor necrosis factor blockers and reactivation of latent tuberculosis. Clin Infect Dis. 2004;39:300-2.

59. Chen YH, de Carvalho HM, Kalyoncu U, et al. Tuberculosis and viral hepatitis infection in Eastern Europe, Asia, and Latin America: impact of tumor necrosis factor-α inhibitors in clinical practice. Biologics. 2018;12:1-9.

60. Wallis RS. Reactivation of latent tuberculosis by TNF blockade: the role of interferon gamma. J Investig Dermatol Symp Proc. 2007;12:16-21.

61. Keane J, Bresnihan B. Tuberculosis reactivation during immunosuppressive therapy in rheumatic diseases: diagnostic and therapeutic strategies. Curr Opin Rheumatol. 2008;20:443-9.

62. Cantini F, Niccoli L, Goletti D. Adalimumab, etanercept, infliximab, and the risk of tuberculosis: data from clinical trials, national registries, and postmarketing surveillance. J Rheumatol Suppl. 2014;91:47-55.

63. Cantini F, Nannini C, Niccoli L, Petrone L, Ippolito G, Goletti D. Risk of tuberculosis reactivation in patients with rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis receiving non-anti-TNF-targeted biologics. Mediators Inflamm. 2017;2017:8909834.

64. Cantini F, Niccoli L, Goletti D. Tuberculosis risk in patients treated with non-anti-tumor necrosis factor-α (TNF-α) targeted biologics and recently licensed TNF-α inhibitors: data from clinical trials and national registries. J Rheumatol Suppl. 2014;91:56-64.

65. Burmester GR, Kremer JM, Van den Bosch F, et al. Safety and efficacy of upadacitinib in patients with rheumatoid arthritis and inadequate response to conventional synthetic disease-modifying anti-rheumatic drugs (SELECT-NEXT): a randomised, double-blind, placebo-controlled phase 3 trial. Lancet. 2018;391:2503-12.

66. Cantini F, Blandizzi C, Niccoli L, Petrone L, Goletti D. Systematic review on tuberculosis risk in patients with rheumatoid arthritis receiving inhibitors of Janus Kinases. Expert Opin Drug Saf. 2020;19:861-72.

67. Cohen SB, Tanaka Y, Mariette X, et al. Long-term safety of tofacitinib for the treatment of rheumatoid arthritis up to 8.5 years: integrated analysis of data from the global clinical trials. Ann Rheum Dis. 2017;76:1253-62.

68. Gladman DD, Dougados M, Marzo-Ortega H, et al. Long-term tofacitinib efficacy and safety in psoriatic arthritis with or without prior biologic DMARD exposure: a post hoc analysis. Rheumatol Adv Pract. 2025;9:rkaf008.

69. Smolen JS, Pangan AL, Emery P, et al. Upadacitinib as monotherapy in patients with active rheumatoid arthritis and inadequate response to methotrexate (SELECT-MONOTHERAPY): a randomised, placebo-controlled, double-blind phase 3 study. Lancet. 2019;393:2303-11. Erratum in: Lancet. 2019;393:2590.

70. Souto A, Maneiro JR, Salgado E, Carmona L, Gomez-Reino JJ. Risk of tuberculosis in patients with chronic immune-mediated inflammatory diseases treated with biologics and tofacitinib: a systematic review and meta-analysis of randomized controlled trials and long-term extension studies. Rheumatology (Oxford). 2014;53:1872-85.

71. Winthrop KL, Park SH, Gul A, et al. Tuberculosis and other opportunistic infections in tofacitinib-treated patients with rheumatoid arthritis. Ann Rheum Dis. 2016;75:1133-8.

72. Deodhar A, Gottlieb AB, Boehncke WH, et al.; CNTO1959PSA2001 Study Group. Efficacy and safety of guselkumab in patients with active psoriatic arthritis: a randomised, double-blind, placebo-controlled, phase 2 study. Lancet. 2018;391:2213-24.

73. Mease P, Roussou E, Burmester GR, et al. Safety of ixekizumab in patients with psoriatic arthritis: results from a pooled analysis of three clinical trials. Arthritis Care Res (Hoboken). 2019;71:367-78.

74. Mease PJ, Kellner H, Morita A, et al. Long-term efficacy and safety of risankizumab in patients with active psoriatic arthritis: results from a 76-week phase 2 randomized trial. Rheumatol Ther. 2022;9:1361-75.

75. Mease PJ, Rahman P, Gottlieb AB, et al.; DISCOVER-2 Study Group. Guselkumab in biologic-naive patients with active psoriatic arthritis (DISCOVER-2): a double-blind, randomised, placebo-controlled phase 3 trial. Lancet. 2020;395:1126-36. Erratum in: Lancet. 2020;395:1114.

76. Reich K, Gooderham M, Thaçi D, et al. Risankizumab compared with adalimumab in patients with moderate-to-severe plaque psoriasis (IMMvent): a randomised, double-blind, active-comparator-controlled phase 3 trial. Lancet. 2019;394:576-86. Erratum in: Lancet. 2019;394:564.

77. van der Heijde D, Cheng-Chung Wei J, Dougados M, et al.; COAST-V study group. Ixekizumab, an interleukin-17A antagonist in the treatment of ankylosing spondylitis or radiographic axial spondyloarthritis in patients previously untreated with biological disease-modifying anti-rheumatic drugs (COAST-V): 16 week results of a phase 3 randomised, double-blind, active-controlled and placebo-controlled trial. Lancet. 2018;392:2441-51.

78. Lima LM, Aurilio RB, Fonseca AR, Parente AAAI, Sant'Anna MFBP, Sant'Anna CC. Tuberculosis in children and adolescents with rheumatic diseases using biologic agents: an integrative review. Rev Paul Pediatr. 2023;42:e2022084.

79. Romiti R, Valenzuela F, Chouela EN, et al. Prevalence and outcome of latent tuberculosis in patients receiving ixekizumab: integrated safety analysis from 11 clinical trials of patients with plaque psoriasis. Br J Dermatol. 2019;181:202-3.

80. Kavanaugh A, Puig L, Gottlieb AB, et al.; PSUMMIT 1 Study Group. Maintenance of clinical efficacy and radiographic benefit through two years of ustekinumab therapy in patients with active psoriatic arthritis: results from a randomized, placebo-controlled phase III trial. Arthritis Care Res (Hoboken). 2015;67:1739-49.

81. McInnes IB, Kavanaugh A, Gottlieb AB, et al.; PSUMMIT 1 Study Group. Efficacy and safety of ustekinumab in patients with active psoriatic arthritis: 1 year results of the phase 3, multicentre, double-blind, placebo-controlled PSUMMIT 1 trial. Lancet. 2013;382:780-9.

82. Ritchlin C, Rahman P, Kavanaugh A, et al.; PSUMMIT 2 Study Group. Efficacy and safety of the anti-IL-12/23 p40 monoclonal antibody, ustekinumab, in patients with active psoriatic arthritis despite conventional non-biological and biological anti-tumour necrosis factor therapy: 6-month and 1-year results of the phase 3, multicentre, double-blind, placebo-controlled, randomised PSUMMIT 2 trial. Ann Rheum Dis. 2014;73:990-9.

83. van Vollenhoven RF, Emery P, Bingham CO 3rd, et al. Long-term safety of rituximab in rheumatoid arthritis: 9.5-year follow-up of the global clinical trial programme with a focus on adverse events of interest in RA patients. Ann Rheum Dis. 2013;72:1496-502.

84. Cantini F, Prignano F, Goletti D. Restarting biologics and management of patients with flares of inflammatory rheumatic disorders or psoriasis during active tuberculosis treatment. J Rheumatol Suppl. 2014;91:78-82.

85. Brehm TT, Reimann M, Köhler N, Lange C. (Re-)introduction of TNF antagonists and JAK inhibitors in patients with previous tuberculosis: a systematic review. Clin Microbiol Infect. 2024;30:989-98.

86. Chiu YM, Chen DY. Infection risk in patients undergoing treatment for inflammatory arthritis: non-biologics versus biologics. Expert Rev Clin Immunol. 2020;16:207-28.

87. Kerschbaumer A, Smolen JS, Ferreira RJO, et al. Efficacy and safety of pharmacological treatment of psoriatic arthritis: a systematic literature research informing the 2023 update of the EULAR recommendations for the management of psoriatic arthritis. Ann Rheum Dis. 2024;83:760-74.

88. Murdaca G, Negrini S, Pellecchio M, et al. Update upon the infection risk in patients receiving TNF alpha inhibitors. Expert Opin Drug Saf. 2019;18:219-29.

89. Gialouri CG, Evangelatos G, Fragoulis GE. Choosing the appropriate target for the treatment of psoriatic arthritis: TNFα, IL-17, IL-23 or JAK inhibitors? Mediterr J Rheumatol. 2022;33(Suppl 1):150-61.

90. Ji X, Hu L, Wang Y, et al. Risk of tuberculosis in patients with rheumatoid arthritis treated with biological and targeted drugs: meta-analysis of randomized clinical trials. Chin Med J (Engl). 2022;135:409-15.

91. Kolli SS, Kepley AL, Cline A, Feldman SR. A safety review of recent advancements in the treatment of psoriasis: analysis of clinical trial safety data. Expert Opin Drug Saf. 2019;18:523-36.

92. Zhang Z, Deng W, Wu Q, Sun L. Tuberculosis, hepatitis B and herpes zoster in tofacitinib-treated patients with rheumatoid arthritis. Immunotherapy. 2019;11:321-33.

93. Chalid MT, Puspawaty D, Tahir AM, Najdah H, Massi MN. Tuberculin test versus interferon gamma release assay in pregnant women with household contacts of tuberculosis patients. Int J Mycobacteriol. 2022;11:364-70.

94. Kaplan SR, Escudero JN, Mecha J, et al. Interferon gamma release assay and tuberculin skin test performance in pregnant women living with and without HIV. J Acquir Immune Defic Syndr. 2022;89:98-107.

95. Lighter-Fisher J, Surette AM. Performance of an interferon-gamma release assay to diagnose latent tuberculosis infection during pregnancy. Obstet Gynecol. 2012;119:1088-95. Erratum in: Obstet Gynecol. 2012;120:399.

96. American Thoracic Society. Medical section of the American Lung Association: treatment of tuberculosis and tuberculosis infection in adults and children. Am Rev Respir Dis. 1986;134:355-63.

97. Czeizel AE, Rockenbauer M, Olsen J, Sørensen HT. A population-based case-control study of the safety of oral anti-tuberculosis drug treatment during pregnancy. Int J Tuberc Lung Dis. 2001;5:564-8.

98. Franks AL, Binkin NJ, Snider DE Jr, Rokaw WM, Becker S. Isoniazid hepatitis among pregnant and postpartum Hispanic patients. Public Health Rep. 1989;104:151-5.

99. Snider DE Jr, Layde PM, Johnson MW, Lyle MA. Treatment of tuberculosis during pregnancy. Am Rev Respir Dis. 1980;122:65-79.

100. Wachstein M. Evidence for abnormal vitamin B6 metabolism in pregnancy and various disease states. Am J Clin Nutr. 1956;4:369-73; discussion, 373-7.

101. Steen JS, Stainton-Ellis DM. Rifampicin in pregnancy. Lancet. 1977;2:604-5.

102. Bothamley G. Drug treatment for tuberculosis during pregnancy: safety considerations. Drug Saf. 2001;24:553-65.

103. Chouraqui JP, Bessard G, Favier M, Kolodie L, Rambaud P. Hémorragie par avitaminose k chez la femme enceinte et le nouveau-né. Rôle éventuel de la rifampicine. A propos de 2 observations [Haemorrhage associated with vitamin K deficiency in pregnant women and newborns. Relationship with rifampicin therapy in two cases]. Therapie. 1982;37:447-50. French.

104. Eggermont E, Logghe N, Van De Casseye W, et al. Haemorrhagic disease of the newborn in the offspring of rifampicin and isoniazid treated mothers. Acta Paediatr Belg. 1976;29:87-90.

105. Snider DE Jr, Powell KE. Should women taking antituberculosis drugs breast-feed? Arch Intern Med. 1984;144:589-90.

106. McKenzie SA, Macnab AJ, Katz G. Neonatal pyridoxine responsive convulsions due to isoniazid therapy. Arch Dis Child. 1976;51:567-8.

107. Kodadhala V, Gudeta A, Zerihun A, et al. Postpartum tuberculosis: a diagnostic and therapeutic challenge. Case Rep Pulmonol. 2016;2016:3793941.

108. Mittal H, Das S, Faridi MM. Management of newborn infant born to mother suffering from tuberculosis: current recommendations & gaps in knowledge. Indian J Med Res. 2014;140:32-9.

109. American Academy of Pediatrics Committee on Drugs. Transfer of drugs and other chemicals into human milk. Pediatrics. 2001;108:776-89.

110. T.C. Sağlık Bakanlığı Türkiye Halk Sağlığı Kurumu. Anti-TNF kullanan hastalarda tüberküloz rehberi. Ankara: T.C. Sağlık Bakanlığı; 2016. Erişim linki: https://hsgm.saglik.gov.tr/depo/birimler/tuberkuloz-db/Dokumanlar/Rehberler/Anti-TNF_Kullanan_Hastalarda_TB_Rehberi.pdf

111. Sterling TR, Njie G, Zenner D, et al. Guidelines for the treatment of latent tuberculosis infection: recommendations from the National Tuberculosis Controllers Association and CDC, 2020. MMWR Recomm Rep. 2020;69:1-11.