



Authors (Ref)	Exclusion criteria
	<b>RA</b>
Dhakad U, et al. [48]	<ul style="list-style-type: none"><li>• Other autoimmune diseases,</li><li>• secondary causes of osteoporosis (such as diabetes, celiac disease, and thyroid disease),</li><li>• severe Vitamin D deficiency,</li><li>• chronic liver disease,</li><li>• chronic kidney disease stage 3 and above,</li><li>• patients who were on medications that would possibly alter the BMD such as anticonvulsants were excluded from the study,</li><li>• postmenopausal osteoporosis is a potential confounder.</li></ul>
El-Bakry S, et al. [49]	<ul style="list-style-type: none"><li>• Paget disease,</li><li>• multiple myeloma,</li><li>• breast cancer,</li><li>• bone metastasis,</li><li>• patients who were receiving biological treatment in the form of TNF-<math>\alpha</math> inhibitors during the last 6 months were excluded from this study.</li></ul>
Singh A, et al. [50]	<ul style="list-style-type: none"><li>• Age less than 15 years,</li><li>• patients on treatment of disease modifying anti rheumatic drug,</li><li>• evidence of steroid use in past 1 month,</li><li>• calcium supplement in last 3 months,</li><li>• diabetes mellitus,</li><li>• chronic kidney disease,</li><li>• chronic liver disease.</li></ul>
Mehaney DA, et al. [51]	<ul style="list-style-type: none"><li>• Diabetes mellitus,</li><li>• hyperthyroidism,</li><li>• receiving thyroxin or calcium replacement therapy or steroid therapy</li></ul>
Świerkot J, et al. [52]	<ul style="list-style-type: none"><li>• Pregnancy or breastfeeding,</li><li>• other systemic diseases of connective tissue besides RA,</li><li>• clinically significant impairment of hepatic and renal function,</li><li>• alcohol abuse,</li><li>• infection with hepatotropic viruses,</li><li>• infections resistant to therapy,</li><li>• history of cancer if no cure was achieved,</li></ul>

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- uncontrolled diabetes,
  - patient unwilling or unable to cooperate.
- Seror R, et al. [53]
- Another defined inflammatory rheumatic disease
  - patients had to be free of any steroids and DMARDs (except within the 15 days before inclusion for DMARDs only).

#### SLE

- Fayed A, et al. [66]
- Any conditions that may cause glomerulopathy including diabetes and essential hypertension,
  - atients with SLE with a history of lupus nephritis and who showed no evidence of activity.
- Garcia-de los Ríos C, et al. [69]
- No data.

#### PsA

- Fassio A, et al. [74]
- Further systemic inflammatory diseases,
  - active infections,
  - neoplasms,
  - metabolic bone diseases,
  - pregnancy,
  - current use of biologic therapy,
  - current use of drugs known to affect bone metabolism,
  - use of corticosteroids in the last 6 months.
- Fassio A, et al. [75]
- Previous treatment with biologic drugs,
  - other systemic inflammatory diseases,
  - active infections,
  - neoplasms,
  - kidney, liver, endocrine or metabolic bone diseases,
  - pregnancy,
  - current use of biologic treatments, corticosteroids or drugs known to affect bone metabolism.
- Diani M, et al. [76]
- Pregnancy,
  - current or previous malignancies,
  - other acute or chronic inflammatory diseases, infectious diseases (human immunodeficiency virus (HIV), hepatitis B and C, tuberculosis),
  - other rheumatologic diseases,
  - primary bone metabolic diseases,
  - recent bone fractures (within 6 months),
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- anxiety,
  - psychosis, or depressive disorders,
  - supplementations, or particular diets (included fasting).
- Pinto Tasende JA, et al. [77]
- Macroscopic or microscopic characteristics of the synovial membrane samples presented characteristics different from the underlying pathology (e.g., deposits of urate or PPCD crystals, pigmented villonodular synovitis or vasculitis).

### AS

- Appel H, et al. [84]
- No data.
- Heiland GR, et al. [85]
- None of the patients was treated with tumour necrosis factor (TNF) blockers.
- Saad CG, et al. [86]
- Other diseases that may have an effect on bone metabolism such as hyperthyroidism, malabsorption syndrome, kidney and liver failure, alcohol,
  - prior or current use of bisphosphonates,
  - current glucocorticoid use (> 5 mg/day) for patients and glucocorticoid use for control group.
- Klingberg E, et al. [87]
- Psoriasis,
  - inflammatory bowel disease,
  - dementia,
  - other concomitant rheumatic disease,
  - difficulties in understanding Swedish.
- Sakellariou GT, et al. [88]
- Uncontrolled thyroid disease, primary or secondary hyperparathyroidism and osteoporosis,
  - severe liver or kidney disease (creatinine clearance <60ml/min/1.73m<sup>2</sup>),
  - any malignancy,
  - alcohol abuse,
  - use of glucocorticoids in the previous 6 months,
  - a high in take of NSAIDs according to the recently proposed.
- Rossini M. et al. [89]
- Inflammatory bowel disease, clinical or laboratory evidence of hepatic, renal or bone metabolic diseases,
  - treatment with drugs known to interfere with bone or mineral metabolism, including TNF- $\alpha$  blockers, glucocorticoids, and bisphosphonates.
- Solmaz D, et al. [90]
- Uncontrolled hypertension,
  - severe hepatic and kidney disease (creatinine clearance <60 mL/min),
  - severe obesity (body mass index >35 kg/m<sup>2</sup>),
  - malignancy,
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	<ul style="list-style-type: none"><li>• patients receiving TNF inhibitor (TNFi).</li></ul>
Genre F, et al. [91]	<ul style="list-style-type: none"><li>• Cardiovascular events,</li><li>• diabetes mellitus,</li><li>• chronic kidney disease,</li><li>• IBD,</li><li>• psoriasis.</li></ul>
Luchetti MM, et al. [92]	<ul style="list-style-type: none"><li>• TNF inhibitors upon entry in the study and/or for <math>\geq 3</math> months before the collection of biological samples,</li><li>• use of cyclooxygenase-2 inhibitors, which could induce IBD flare, was not allowed, except occasionally for the relief of pain.</li></ul>
Perrotta FM, et al. [93]	<ul style="list-style-type: none"><li>• Age <math>\leq 18</math> years,</li><li>• the presence of history of bone fractures in the previous 24 months,</li><li>• no treatment with bisphosphonate agents.</li></ul>
Gercik O, et al. [94]	<ul style="list-style-type: none"><li>• Age <math>\leq 18</math> years,</li><li>• pregnant or lactating,</li><li>• end-stage renal disease,</li><li>• malignant tumor,</li><li>• cirrhosis,</li><li>• hyperthyroidism,</li><li>• hyperparathyroidism or Cushing's syndrome,</li><li>• using tumor necrosis factor inhibitors (TNFi).</li></ul>
Iaromenko O, et al. [95]	<ul style="list-style-type: none"><li>• A history of the other rheumatic diseases,</li><li>• spinal surgery,</li><li>• spinal tumor.</li></ul>
Korkosz M, et al. [96]	<ul style="list-style-type: none"><li>• No data.</li></ul>
Sun W, et al. [98]	<ul style="list-style-type: none"><li>• Low phosphorus rickets and osteoporosis with pathological fracture as well as malignant diseases.</li></ul>
Sakellariou GT, et al. [99]	<ul style="list-style-type: none"><li>• History of osteoporosis,</li><li>• severe liver or kidney dysfunction,</li><li>• history of cardiovascular disease, diabetes mellitus or metabolic syndrome,</li><li>• any malignancy,</li><li>• previous use of biphosphonates or other anti-osteoporotic treatment,</li><li>• use of glucocorticoids in the previous 6 months,</li></ul>

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	<ul style="list-style-type: none"><li>• a high intake of non-steroidal anti-inflammatory drugs (NSAIDs) according to the recently proposed.</li></ul>
Taylan A, et al. [100]	<ul style="list-style-type: none"><li>• History of neuroendocrine disorder (thyroid, parathyroid disorder, and anticonvulsant usage),</li><li>• chronic renal and liver disease,</li><li>• systemic steroid usage, menopause,</li><li>• cigarette smoking,</li><li>• excessive alcohol usage.</li></ul>
Tuylu T, et al. [101]	<ul style="list-style-type: none"><li>• Renal impairment (serum creatinine.1.4 mg/dl),</li><li>• patients who were treated with glucocorticoids during the previous four weeks.</li></ul>

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**Supplementary materials – Table 1.** Summary of exclusion criteria.