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Immunomodulatory Potential of *Curcuma longa* Extract as Adjuvant Therapy for Peritonitis: A Systematic Review of Inflammatory Biomarkers IL-6 and Myeloperoxidase

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ABSTRACT
Peritonitis is a severe inflammatory condition of the peritoneum associated with high morbidity and mortality, often progressing to sepsis due to excessive inflammatory responses. Pro-inflammatory cytokines such as interleukin-6 (IL-6) and neutrophil-derived enzymes like myeloperoxidase (MPO) play critical roles in disease progression and tissue damage. Current treatments primarily focus on infection control; however, adjunctive therapies targeting inflammation remain limited. This study aims to evaluate the potential of *Curcuma longa* extract as an adjuvant therapy in modulating IL-6 levels and MPO activity in peritonitis. This research employed a systematic review design following PRISMA 2020 guidelines. Literature was collected from Scopus, PubMed, Google Scholar, and ScienceDirect using predefined inclusion and exclusion criteria. A total of four eligible experimental studies (in vivo and in vitro) were analyzed. The findings demonstrate that *Curcuma longa* extract, particularly curcumin, significantly reduces IL-6 expression and modulates MPO activity, indicating decreased inflammatory response and neutrophil infiltration. These effects are associated with the inhibition of key inflammatory pathways such as NF-κB and MAPK.In conclusion, *Curcuma longa* shows promising potential as an adjunctive therapy for peritonitis by attenuating inflammatory biomarkers. However, further standardized studies and clinical trials are required to confirm its efficacy and optimal therapeutic dosage.

INTRODUCTION

Peritonitis, the inflammation of the peritoneum, represents a serious medical condition resulting from bacterial contamination, chemical irritation, or both. Peritonitis has a high mortality rate of 20-40%, especially in cases of secondary peritonitis. Secondary peritonitis and intra-abdominal sepsis continue to represent a growing global health burden, with outcomes remaining poor despite advances in surgical and critical care management (Clements et al., 2021). The pathophysiology of peritonitis involves a complex inflammatory cascade triggered by bacterial invasion or chemical irritants, leading to release of pro-inflammatory cytokines (TNF-α, IL-1β, IL-6, IL-8), endothelial malfunction, increased vascular permeability, neutrophil invasion, and oxidative stress are all caused by activation of the nuclear factor-kappa B (NF-κb) pathway, and potential progression to systemic inflammatory response syndrome (SIRS) and sepsis (AKÇAKAYA and AKÇAKAYA, 2023; Bezzerri et al., 2025)

Peritonitis encompasses the secretion of various inflammatory substances, including interleukin-6 (IL-6) and neutrophil activation characterized by increased myeloperoxidase (MPO). IL-6 acts as a key inflammatory biomarker that indicates the severity of sepsis, while MPO is an enzyme released by neutrophils during phagocytosis and contributes to tissue damage through the production of ROS (reactive oxygen species) (Aufricht et al., 2012; Bezzerri et al., 2025). MPO is produced predominantly by polymorphonuclear neutrophils and its elevated activity serves as one of the most reliable diagnostic indicators of inflammatory and oxidative stress responses in various disease states (Khan et al., 2018)

Current standard treatment includes source control (surgical intervention), broad-spectrum antibiotics, and supportive care. However, the excessive inflammatory response often contributes to organ dysfunction and poor outcomes, highlighting the need for adjunctive anti-inflammatory strategies (Saber et al., 2023).

The urgency of this issue is reinforced by the persistently high mortality reported in secondary peritonitis and other severe intra-abdominal infections. Recent reviews describe intra-abdominal infections as a major cause of morbidity and mortality in hospital settings, while secondary generalized peritonitis is repeatedly reported with short-term mortality commonly around 15–20% and, in some populations or complicated cases, substantially higher. This evidence shows that although surgery, antibiotics, and intensive care have improved survival, many patients still experience poor outcomes due to delayed diagnosis, severe inflammatory burden, or progression to septic shock. Therefore, contemporary peritonitis research increasingly requires approaches that not only eradicate infection but also modulate harmful host inflammation.

At the biomolecular level, peritonitis is characterized by activation of inflammatory signalling pathways that stimulate cytokine release, neutrophil recruitment, oxidative stress, and tissue injury. Among the many inflammatory mediators involved, interleukin-6 (IL-6) and myeloperoxidase (MPO) occupy an important position because they reflect two key dimensions of disease progression. IL-6 is widely recognized as a central pro-inflammatory cytokine linked to severity of infection and dysregulated immune response, whereas MPO is a neutrophil-derived enzyme that reflects inflammatory cell infiltration and oxidative tissue damage (Lin et al., 2024). Recent biomarker-focused literature on secondary peritonitis continues to highlight IL-6 among relevant inflammatory indicators, while MPO remains strongly connected to inflammation-oxidative stress interactions in disease progression. These markers are therefore scientifically appropriate for evaluating adjunctive anti-inflammatory strategies in peritonitis.

In parallel with advances in biomarker research, there has been growing interest in plant-derived compounds with anti-inflammatory and immunomodulatory potential. Curcuma longa, commonly known as turmeric, has long been used in traditional medicine, and its major bioactive constituent, curcumin, has attracted substantial scientific attention due to its antioxidant, anti-inflammatory, and regulatory effects on multiple signalling pathways. Recent reviews describe curcumin as capable of modulating NF-κB, MAPK, NLRP3 inflammasome, and related inflammatory cascades, suggesting that it may attenuate excessive cytokine production and reduce oxidative injury (Liu et al., 2017; Lahori & Ramana, 2025). This broad pharmacological profile makes Curcuma longa a promising candidate for adjunctive therapy in inflammatory conditions where tissue damage is aggravated by an overactive host response, including peritonitis.

Evidence from broader clinical and translational studies also supports the anti-inflammatory relevance of curcumin, although findings vary by population, formulation, and biomarker. A meta-analysis of randomized controlled trials published in Cytokine found that curcumin or turmeric supplementation showed beneficial effects on some pro-inflammatory cytokines, even though the reduction in IL-6 was not consistently significant across all pooled studies (Gorabi et al., 2021). More recent meta-analytic evidence has reported statistically significant reductions in IL-6 together with improvements in other inflammatory and oxidative stress biomarkers (Dehzad et al., 2023). These mixed but generally favourable findings indicate that curcumin has biologically plausible anti-inflammatory activity, yet they also suggest that efficacy may depend on dose, bioavailability, delivery system, and disease context. This creates a strong rationale to study curcumin more specifically in peritonitis rather than extrapolating from unrelated inflammatory disorders.

More specifically, several experimental studies relevant to peritonitis have already provided an initial basis for investigation. Savitha et al. (2015) reported that curcumin in endotoxin-induced experimental peritonitis reduced inflammatory injury and suggested modulation of MPO-related inflammatory activity. Liu et al. (2016) demonstrated in zymosan-induced peritonitis that curcumin reduced cytokine production, neutrophil infiltration, MPO activity, and tissue damage. Ng et al. (2020), working on feline infectious peritonitis, showed that curcumin-encapsulated chitosan nanoparticles lowered inflammatory expression and improved curcumin bioavailability, while Kaboutari et al. (2024) found that slow-release curcumin-loaded selenium nanoparticles decreased IL-6 in experimental peritonitis. Collectively, these studies indicate that curcumin may influence both cytokine-mediated and neutrophil-mediated inflammatory pathways in peritonitis models.

However, the specific issue is that the available evidence remains fragmented and methodologically heterogeneous. Existing studies differ in experimental model, species, induction method, formulation, route of administration, observation period, and primary outcome. Some studies focus more strongly on cytokine expression, others on tissue injury or oxidative stress, and only a limited number assess IL-6 and MPO together as linked inflammatory biomarkers. The uploaded manuscript itself identifies that only a small set of eligible studies met the review criteria, indicating that the current evidence base is still narrow and dispersed. As a result, despite promising findings, there is still no sufficiently integrated understanding of how Curcuma longa modulates inflammatory biomarkers in peritonitis across available studies.

This condition reveals a clear research gap. First, most prior studies are preclinical, so translational relevance to human adjunctive therapy remains underdeveloped. Second, there is no widely accepted synthesis specifically cantered on Curcuma longa extract in peritonitis with combined attention to IL-6 and MPO as representative markers of cytokine signalling and neutrophil infiltration. Third, variation in formulation, including conventional curcumin, nanoparticle-based delivery, and encapsulated systems, complicates direct comparison of outcomes and may mask the true therapeutic potential of the compound. Accordingly, a focused systematic review is needed to organize current evidence, compare biomarker trends, and identify where the strongest and weakest evidence presently lies.

Based on that gap, this research becomes urgent because adjunctive strategies for peritonitis are clinically meaningful only when they can be justified through a careful synthesis of mechanistic and experimental evidence. Standard treatment remains indispensable, especially source control and broad-spectrum antibiotics, but current international guidance on sepsis management also underscores the need to prevent organ dysfunction and optimize recovery through timely and comprehensive care. In that context, investigating Curcuma longa is not intended to replace definitive therapy, but to explore whether it can support treatment by attenuating excessive inflammation. A systematic review can therefore help determine whether the current evidence is strong enough to justify future translational research, standardized experimental protocols, and eventually clinical testing in human peritonitis.

The novelty of this research lies in its focused synthesis of Curcuma longa as an adjuvant therapy for peritonitis through the dual lens of IL-6 and MPO, two biomarkers that reflect complementary inflammatory processes. Unlike broader reviews on curcumin in general inflammatory diseases, this study concentrates on peritonitis-specific evidence and evaluates whether Curcuma longa consistently modulates both cytokine-driven inflammation and neutrophil-associated oxidative damage. Therefore, the purpose of this research is to systematically identify, appraise, and synthesize available studies on the effect of Curcuma longa extract in peritonitis, while the objective is to examine its potential influence on IL-6 and MPO levels. The expected contribution and benefit of this study are theoretical and practical: it may enrich the biomolecular understanding of peritonitis inflammation, clarify the current position of Curcuma longa in adjunctive therapy research, identify methodological limitations in prior work, and provide a scientific basis for future preclinical and clinical investigations.

METHOD

The 2020 PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines were followed in conducting this systematic review. Objective of this review is to synthesize existing evidence regarding the effectiveness of Curcuma longa extract as an adjuvant therapy in modulating IL-6 levels and myeloperoxidase in peritonitis. To achieve this, original research articles were selected based on predetermined inclusion and exclusion.

Inclusion criteria in this systematic review were: (1) Experimental studies (in vivo and in vitro) that evaluated the effects of Curcuma longa extract or curcumin in peritonitis models, (2) Studies that measured at least one of the biomarkers: IL-6 or myeloperoxidase (3) Published articles in English or Indonesian, available full-text articles, studies with a clear control group. Exclusion criteria include: (1) Review studies, meta-analyses, case reports, or editorials, (2) Studies that only use synthetic curcumin analog compounds without Curcuma longa extract, (3) studies with unclear methodology or incomplete data, (4) Duplicate publications.

The following electronic databases were used for a literature search: Scopus, PubMed/MEDLINE, Google Scholar, and Science Direct. “Curcuma longa” OR “curcumin” OR “turmeric”) AND (“peritonitis” OR “peritoneal infection” OR “intraperitoneal infection”) AND (“IL-6” OR “interleukin-6” OR “myeloperoxidase” OR “MPO” OR “inflammation” OR “inflammatory markers”. The search period covered all publications up to October 2025.

Additional searches were conducted through references to relevant articles (backward searching) and articles citing included studies (forward searching).

The selection process was carried out in two stages, namely screening stage 1 and 2. Screening stage 1 was carried out by screening titles and abstracts based on eligibility criteria by two independent researchers. Stage 2 Screening is to thoroughly evaluate full-text articles that pass the first stage. Conflicts were settled by discussion or the inclusion of a third researcher. Mendeley software was used for reference management and duplication identification.

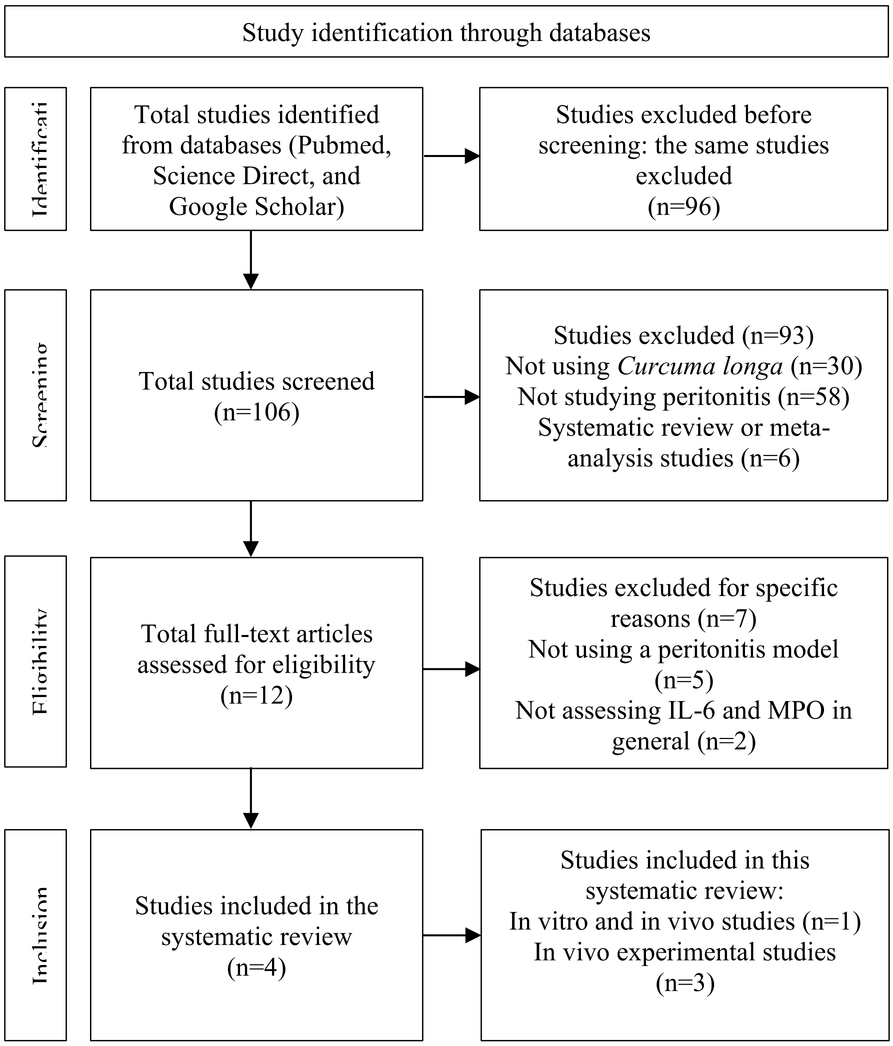

Figure 1. PRISMA diagram

RESULT AND DISCUSSION

This methodical review included and evaluated four studies that satisfied the inclusion criteria. These consist of three in vivo experimental investigations and one in vivo and in vitro study. These studies collectively evaluate the potential module immune of Curcuma Longa extract as adjuvant therapy for peritonitis, with IL-6 and myeloperoxidase as inflammatory parameters.

Table 1. Inclusion Study Characteristic

Author, year	Country	Design study	Model	Peritonitis Induction	Intervention	Dose	Biomarker
D,S, Mani I, et al. 2015	India	In vivo	Wistar rats	Intraperitoneal injection of 5 mg/kg of LPS	Curcumin solution	30 mg/kg body weight	Myeloperoxidase (MPO)
Kaboutari, et al 2024	Iran	In vivo	Wistar rats	Cecal abrasion method	Curcumin and curcumin@S.N	50 mg/kg of curcumin, and Cur@S.N (0.25+50 mg/kg)	IL-6
Liu, et al. 2016	Cina	In vivo	Wild-type C57BL/6 mice	Zymosin induced peritonitis	Curcumin was dissolved in DMSO	200 mg/kg Intraperitoneal	MPO, IL-6
Wei, et al. 2020	Malaysia	In Vitro And in vivo	Cats	FIPV induced	Curcumin-encapsulated chitosan (Cur-CS)	250 mg/kg	IL-6

Effect in IL-6

Kaboutari et al, in their in vivo research, they examine the impact of selenium nanoparticles containing slow-release curcumin on various inflammatory markers in a model of experimental peritonitis. The group that was used as a control did not undergo any treatment, while the other groups were administered single intraperitoneal injections of 50 mg/kg of curcumin, 0.25 mg/kg S.N, and a combination of 0. 25 mg/kg S.N and 50 mg/kg curcumin (Cur@S. N). On days 3, 7, and 14, the concentration of IL-6 was assessed. On day three, there was a substantial difference between Cur@S.N and the curcumin groups and the control group ($P<0.05$). Additionally, the Cur@S. N group exhibited the minimum concentration of IL-6. By day 7, the IL-6 concentrations in all the treatment groups were significantly reduced compared to the control group ($P<0.05$). Simultaneously, there was no notable variation observed between the Cur@S.N and curcumin groups ($P>0.05$) and the minimal amount of IL-6 was observed in the S. N group. On the 14th day, there was no notable distinction between the treatment and control groups ($P>0.05$).(Kaboutari et al., 2024)

The plasma levels of pro-inflammatory cytokines, including IL-6, which played a role in regulating inflammation through the control of cytokine release, were assessed in a study conducted by Liu et al. A marked elevation of IL-6 was noted in mice with zymosan-induced peritonitis, whereas a notable reduction of IL-6 was seen in the group that received curcumin treatment. Moreover, curcumin did not induce notable alterations in the cytokine levels in the mice that were part of the control group (Liu et al., 2016)

With GAPDH used as the reference gene and virus-free cells acting as the negative control, Wei et al. investigated the effects of the Cur-Cs nanoparticles and curcumin on proinflammatory cytokine mRNA expression and IL-6 levels in peritonitis using reverse transcriptase Qpcr. Cells treated with Cur-CS nanoparticles and curcumin showed lower IL-6 expression levels, while untreated virus-infected cells exhibited considerably higher IL-6 mRNA expression levels (Ng et al., 2020).

Effect in Myeloperoxidase

In their in vivo experiment, Mani et al. investigated the impact of curcumin administered intraperitoneally on rats with endotoxin-induced peritonitis. Three and twenty-four hours after peritonitis was induced, blood and peritoneal fluid samples were taken. When compared to the control group, the experimental group had a much lower level of MPO (myeloperoxidase) activity at 3 hours and a significant increase at 24 hours. (D et al., 2015)

The rise in MPO activity is widely recognized to be an indicator of neutrophil buildup and penetration into particular tissues, as well as increased tissue damage. To determine the intensity of the inflammatory response, the amount of MPO, which is an enzyme found within PMN lysosomes, was assessed in the collected tissue specimens. The findings indicated a notable elevation in MPO activity following the introduction of zymosan. Following curcumin administration, a reduction in MPO activity was seen in the tissue specimens obtained from mice treated with zymosan (Liu et al., 2016).

This systematic review evaluated the potential modulate immune of curcuma longa extract as adjuvant therapy for peritonitis, using the inflammatory parameters such as IL-6 and myeloperoxidase. Four included studies, demonstrated a positive effect of curcuma longa as anti-inflammatory on peritonitis. These findings support its role as an adjuvant therapy for peritonitis treatment.

Peritonitis and Inflammation

Peritonitis represents a critical inflammatory condition of the peritoneum. This condition constitutes a major cause of morbidity and mortality in surgical and critical care settings. Peritonitis can be classified based on etiology into several categories, as primary bacterial peritonitis, secondary peritonitis as results from perforation or injury to the gastrointestinal tract, and tertiary peritonitis represents a persistent or recurrent infection. Secondary peritonitis and intra-abdominal sepsis remain a global health challenge, with systemic therapies to control the subsequent inflammatory response remaining scarce despite advances in intensive care (Clements et al., 2021). The pathophysiology of peritonitis involves complex biomolecular cascades that include innate immune activation, cytokine release, and oxidative stress responses.

The inflammatory response in peritonitis is characterized by a rapid and robust activation of both adaptive and innate immune mechanisms. Upon bacterial invasion or tissue injury, the nuclear factor-kappa B (NF-Kb) and MAPK (mitogen-activated protein kinase) signaling cascades are triggered within peritoneal macrophages and mesothelial cells, which results in the production of a wide array of inflammatory substances through transcriptional processes (Liu et al., 2017; Yin et al., 2024). This process gives rise to the creation of cytokines that encourage inflammation, such as tumor necrosis factor-alpha (TNF-α), interleukin-6 (IL-6), interleukin-1 beta (IL-1β), and interleukin-8 (IL-8), these substances coordinate the attraction and triggering of monocytes, neutrophils, and lymphocytes to the area where the infection is located.

Curcumin as Anti-inflammatory

For ages, turmeric has been employed to alleviate discomfort linked to inflammatory conditions, pain management, and recovery from injuries. Obtained from the Curcuma longa plant's root, curcumin is a naturally occurring polyphenolic substance frequently incorporated as a food ingredient in the culinary sector. The chemical configuration of curcumin is recognized as 1,7-bis (4-hydroxy-3-methocyphenyl) – 1,6-heptadiene-3,5-dione. Curcumin displays properties that combat inflammation, oxidation, cancer development, viral infections, and microbial growth. Additionally, curcumin has numerous possible medicinal qualities, including actions that combat tumors, prevent cell death, inhibit blood vessel formation, kill cells, regulate the immune system, prevent blood clots, aid in wound repair, prevent diabetes, reduce stress, and prevent the formation of stones. Its wide array of biological actions is largely attributed to its anti-inflammatory qualities, which are also very important when treating various illnesses (Abu-Hijleh et al., 2024; Liu et al., 2025)

Curcumin's notable capacity to reduce inflammation is due to its control over several crucial communication routes within cells, such as those involving MAPK, NF-Kb, the NLRP3 inflammasome, JAK-STAT, and Nrf2/ARE, highlighting its anti-inflammatory effectiveness. Research indicates that curcumin's anti-inflammatory properties function by diminishing the impact of various substances, including TNF (tumor necrosis factor), the transcription factor NF-κB (nuclear factor-Kb), interleukin-8 (IL-8), iNOS (inducible nitric oxide synthase), interleukin-6 (IL-6), adhesion molecules, cyclooxygenase-2 (COX-2), 5-lipoxygenase (5-LOX), and matrix metalloproteinase-9 (MMP-9) (Liu et al., 2025). A comprehensive umbrella meta-analysis further confirmed that curcumin supplementation significantly reduces inflammatory biomarkers including IL-6, CRP, and TNF-α, supporting its value as an adjunctive anti-inflammatory agent across multiple disease contexts (Kavyani et al., 2022). These pharmacological properties, combined with evidence from preclinical models, substantiate curcumin's potential role as an immunomodulatory adjuvant in peritonitis therapy (Lahori & Ramana, 2025).

Curcumin and its effect in IL-6

Interleukin-6 (IL-6) is a cytokine that encourages inflammation, assuming key functions in a number of inflammatory reactions, such as controlling antibody (as well as autoantibody) creation, turning on T cells, allowing B cells to become distinct, boosting acute-phase protein creation, blood cell production and the creation of new blood vessels, blood vessel wall leakiness, and the specialization of cells that degrade bone. IL-6 contributes to the development of various inflammatory conditions as well. Elevated plasma IL-6 levels are associated with increased risk of organ dysfunction and greater disease severity, making it a clinically relevant biomarker for monitoring sepsis progression and adjunctive therapy efficacy (Liu & Chen, 2024). Ample research indicates that reducing IL-6 levels or blocking IL-6 signals correlates with curcumin's therapeutic benefits, implying that altering IL-6 activity plays a part in curcumin's anti-inflammatory properties (Ghandadi and Sahebkar, 2017; Gorabi et al., 2021; Aurelia et al., 2022). A meta-analysis of meta-analyses further demonstrated that curcumin supplementation produces significant reductions in IL-6 together with other markers of inflammation and oxidative stress, reinforcing its potential value as an adjunct therapy (Musazadeh et al., 2024)

In peritonitis, following harm to the abdominal lining, IL-6, which is an inflammatory cytokine, is produced in response to acute infection and inflammation. The levels of IL-6 and TNF-α were markedly reduced by curcumin treatment in the present research. Curcumin influences the way arachidonic acid is processed in the body and reduces inflammation. It achieves this by blocking the PLA2 enzyme, reducing the amount of COX2 gene that is produced, and also by blocking the 5-LO enzyme. Curcumin also acts to suppress a variety of inflammatory cytokines, for instance, IL-6, IL-1, chemokines, together with TNF-α. (Kaboutari et al., 2024). These mechanisms align with findings from large-scale meta-analyses demonstrating that curcumin and turmeric supplementation significantly reduces serum levels of CRP, TNF-α, and IL-6 in subjects with inflammatory backgrounds, confirming the biological plausibility of curcumin as an adjunctive anti-inflammatory agent (Dehzad et al., 2023). Furthermore, the broad regulatory capacity of curcumin across NF-κB, MAPK, and JAK-STAT pathways confirms its potential as a multi-target modulator of cytokine-driven inflammation (Yin et al., 2024).

Curcumin and its effect in Myeloperoxidase

Myeloperoxidase, which contains a heme group, plays a role in the oxidation of LDL. Following occurrences of inflammation, this substance is discharged by monocytes, neutrophils, and tissue macrophages when they break down (pour et al., 2019). MPO belongs to the family of heme-containing peroxidases produced predominantly by polymorphonuclear neutrophils, and its enhanced level of activity is recognized as one of the most reliable diagnostic tools for evaluating inflammatory and oxidative stress responses across disease states (Khan et al., 2018). The extent of its functionality serves as a crucial marker for gauging the body's inflammatory reactions and exhibits a clear connection to how different ailments advance. MPO plays a role in inflammation through facilitating the creation of reactive nitrogen and oxygen species (RNS and ROS) and also signaling routes located in immune cells (Ndrepepa, 2019). Overproduction of MPO-derived oxidants draws particular attention to its detrimental role in diseases characterized by acute or chronic inflammation, as MPO and its derived reactive species promote inflammation and oxidative damage through biomolecular oxidation (Lin et al., 2024)

Curcumin effectively stopped the multiple organ injuries linked to peritonitis, which were evident after a day of peritonitis onset, as shown by the detailed tissue analysis of the lungs, intestines, and liver. The group given curcumin displayed very little inflammation, and the organs' basic structure was mostly kept intact; however, the group that didn't receive curcumin showed a lot of neutrophil infiltration, bleeding, and harm to multiple organs. The restorative impact of curcumin appears to be intervened through a resistant stimulatory impact which is appeared by an increment within the neutrophil number within the fringe blood.

Mani et al in their ponder appear that MPO serum action was essentially higher in exploratory gather relating with the expanded circulating pool of neutrophils. Even though higher MPO activity shows more lipid peroxidation and more proinflammatory mediators, research shows that better survival happened without stopping these typical proinflammatory mediators, meaning the deaths weren't caused by too much inflammation from cytokines (D et al., 2015).

Limitations of Previous Studies

Although the findings on the potential modulate immune of Curcuma longa extract as a helper treatment for peritonitis shows hopeful results, several limitations have been identified in existing research. The limited number of studies and short follow-up period hinder the assessment of long term efficacy and safety. Until now, no studies have fully assessed about different dose in one study to know the best dose which have potential effect of Curcuma longa in inflammation. Additionally, poor aqueous solubility and rapid systemic elimination represent major pharmacokinetic barriers to curcumin's clinical application, underscoring the importance of developing effective drug delivery systems to optimize its bioavailability in future studies (Zhao et al., 2024; de Oliveira, 2024).

CONCLUSION

The available evidence strongly suggest that Curcuma longa has a significant effect on inflammation, including in peritonitis as demonstrated by decrease level of IL-6 and MPO. The role of Curcuma longa in peritonitis is associated with the role in the inflammatory process, where curcumin exerts its anti-inflammatory properties primarily through inhibition of the NF-κB and MAPK signaling pathways. Various challenges and weaknesses remain in previous studies. Limited studies have fully assessed the effect of Curcuma longa in peritonitis, especially to IL-6 and MPO levels. No studies evaluated about combination Curcuma longa with other definitive therapy for peritonitis. The lack of standardized treatment protocols, the dose of Curcuma longa used, and the very limited clinical trials highlight the need for further research. To maximize therapeutic outcomes, future studies should explore nanoformulation approaches including polymeric nanoparticles, liposomes, and nanogels, which have shown considerable promise in enhancing curcumin's solubility, stability, and targeted bioavailability. Future studies should look into various doses and different ways of delivering the treatment, particularly as they relate to its role as an adjuvant in peritonitis treatment.

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