



DOSSIER · SUBSTANCE

Oral Hyaluronic Acid

The database includes studies on oral hyaluronic acid, a substantial number of which involve human participants. The controlled trials primarily address **joint health** and **skin**. The evidence base is limited but methodologically robust in the most frequently cited studies. The most notable finding: the systemic effects of oral administration remain controversial, although local effects have been demonstrated in studies.

40

STUDIES IN
TOTAL

17

IN HUMANS

8

OF WHICH
CONTROLLED

8

IN ANIMALS

4

IN THE LAB

Figures from the IHR study database · Last updated 2026-10-15

How to Read This Dossier

ESTABLISHED

measured in humans, with a comparison group

PLAUSIBLE

supported by mechanism, animal studies or observation

HYPOTHESIS

a likely connection that still needs to be tested

Hyaluronic acid (oral) at a glance

ORIGIN:

Hyaluronic acid is a glycosaminoglycan that occurs naturally in connective tissue, synovial fluid, and skin.

STUDY EVIDENCE:

40 evaluated studies · 8 controlled human trials · 9 observational studies · 1 review · 8 animal studies · 3 cell culture studies

STRONGEST EVIDENCE:

- **Joint health** A 12-month double-blind, placebo-controlled study in 60 osteoarthritis patients (Kellgren-Lawrence grade 2/3) showed a tendency towards greater symptomatic improvements (JKOM score) in the hyaluronic acid group (200 mg/day), particularly in those under 70 years of age combined with exercise therapy.
- **Inflammatory processes:** A 3-month study in 40 overweight osteoarthritis patients using oral hyaluronic acid (Oralvisc®) demonstrated significant reductions in pro-inflammatory cytokines (IL-6, TNF-α) and improvements in pain and function scores (VAS, WOMAC). The clinical relevance of these biomarker changes remains unclear.
- **Skin:** A randomised, double-blind study in 129 women showed significant improvements in skin hydration, skin tone, and epidermal thickness after 2–12 weeks of oral hyaluronic acid, without specifying dose or molecular weight.
- **Systemic immunomodulation** A 12-week study in 150 healthy individuals with 120 mg/day hyaluronic acid (1.8 MDa) showed significant reductions in CRP, IL-1β, and metabolic biomarkers (e.g., fetuin-A), suggesting potential immunomodulatory effects. The clinical relevance of these findings is not established.

LIMITATIONS:

- The systemic effect of oral hyaluronic acid remains controversial, as no increase in tissue concentration has been demonstrated. Effects may stem from indirect mechanisms (e.g., gut barrier, microbiome).
- Studies on joints and skin often use subjective scores or surrogate parameters, the clinical relevance of which is unclear. Radiological or structural endpoints are largely absent.
- The evidence base is heterogeneous regarding molecular weight, dosage (80–200 mg/day), and preparation (native vs. hydrolysed hyaluronic acid). Long-term studies (>12 months) are lacking.

ASSESSMENT:

Oral hyaluronic acid shows symptomatic effects in controlled studies for osteoarthritis and skin ageing. Inflammation-modulating effects are suggested by reductions in biomarkers, though their clinical relevance is not established. Systemic bioavailability and the precise mechanism of action are not proven, and structural changes have not been demonstrated.

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1. What Hyaluronic Acid Is and Why the Oral Form Raises Particular Questions

Hyaluronic acid is a **glycosaminoglycan** that occurs naturally in connective tissue, synovial fluid, and skin. It binds water, stabilises the extracellular matrix, and plays a role in cell migration and differentiation. Industrially, it is mostly derived from rooster combs or bacterial fermentation. The oral form differs from topical or injectable preparations in its **molecular size** and **bioavailability**.

The critical point for all studies: hyaluronic acid is not absorbed intact in the gut but is broken down into **smaller fragments**. Whether these fragments act systemically or only locally in the gut remains unclear. Most studies use **high-molecular-weight** or **cross-linked** variants, whose behaviour in the body differs. Measurable outcomes are often only **surrogate parameters**, such as inflammatory markers or subjective scores, rather than actual tissue concentrations.

2. What the Studies Show in Detail

The key human studies and most important reviews—by application area, including population, duration, preparation, outcome measures, and results as reported in the original studies. Numbers are only included where the study specifies them.

Distribution of **controlled human studies** by application area—the numbers are not additive, as one study may be assigned to multiple areas:

APPLICATION AREA	CONTROLLED STUDIES
Musculoskeletal system	4
Musculoskeletal system	4
Inflammatory processes	3
Skin	3
Immune system	2

APPLICATION AREA	CONTROLLED STUDIES
Metabolism	1

Bones and Joints

A randomised, double-blind, placebo-controlled study in 60 participants with knee osteoarthritis (Kellgren-Lawrence grade 2 or 3) investigated the effect of orally administered hyaluronic acid (200 mg/day over 12 months). Participants also performed daily quadriceps-strengthening exercises. The primary endpoint was the *Japanese Knee Osteoarthritis Measure* (JKOM) score. Both groups showed time-dependent improvements in symptoms, with a tendency towards a stronger effect in the hyaluronic acid group—particularly in participants under 70 years of age. In these younger participants, the JKOM score was significantly better at 2 and 4 months compared to the placebo group. The study suggests that oral hyaluronic acid, in combination with exercise therapy, may provide symptomatic improvements in patients under 70 ¹. A limitation is the lack of differentiation between structural (e.g., radiological) and purely symptomatic effects.

Another randomised, double-blind, placebo-controlled pilot study examined the effect of a natural rooster comb extract containing 60% hyaluronic acid (*Hyal-Joint*, 80 mg/day over 8 weeks) in 20 participants (≥40 years) with symptomatic knee osteoarthritis (Kellgren/Lawrence ≥2). The primary endpoint was the *Western Ontario and McMaster Universities Osteoarthritis Index* (WOMAC) pain score. Both groups showed significant improvements in WOMAC pain, stiffness, and function, with the hyaluronic acid group tending to exhibit stronger effects in physical function (difference: -13.1 vs. -10.1 points, $P = 0.575$). However, the study was underpowered with only 10 participants per group, and the lack of statistical significance showed a trend but provided an initial indication of potential effects ².

HYPOTHESIS Both studies suggest that oral hyaluronic acid—particularly in combination with exercise—may have symptomatic effects in mild to moderate osteoarthritis. However, the evidence is heterogeneous, and the observed effects may partly be attributable to placebo or exercise effects. It remains unclear whether the dose (80–200 mg/day) or the molecular size of hyaluronic acid influences efficacy.

Inflammatory Processes

A randomised, double-blind, placebo-controlled study involving 40 overweight patients with knee osteoarthritis examined the effects of an oral hyaluronic acid preparation (*Oralvisc*®) over 3 months. In addition to clinical parameters (VAS pain score, WOMAC function), systemic inflammatory markers (cytokines, bradykinin, leptin) were measured in serum and synovial fluid. Furthermore, the turnover rate of glycosaminoglycans in the synovial fluid was analysed using heavy water (D_2O). The hyaluronic acid group showed significant improvements in pain and function, as well as reductions in pro-inflammatory cytokines (e.g., IL-6, TNF- α), bradykinin, and leptin in both serum and synovial fluid. The D_2O analyses revealed a significantly reduced hyaluronic acid turnover rate in the synovial fluid of the treatment group. The study provides preliminary evidence of systemic anti-inflammatory effects at the biomarker level; however, details on the exact composition of the preparation (e.g., molecular weight of the hyaluronic acid) and long-term clinical effects remain to be investigated ³.

A randomised, placebo-controlled study involving 150 healthy participants investigated the systemic effects of oral hyaluronic acid (1.8 MDa; 60 mg/day or 120 mg/day over 12 weeks). The 120-mg group exhibited significant reductions in pro-inflammatory markers such as CRP, IL-1 β , and arachidonic acid precursors in plasma. Additionally, selective changes in metabolic biomarkers (e.g., fetuin-A, adiponin) were observed, indicating potential immunomodulatory and metabolically protective effects at the biomarker level. However, correlations between plasma parameters and previously reported skin effects were weak, suggesting independent mechanisms of action. The study implies that oral hyaluronic acid may exert systemic effects in healthy individuals at the biomarker level, though clinical endpoints (e.g., inflammatory symptoms) were not assessed ⁸.

An observational study in peritoneal dialysis patients examined the role of hyaluronic acid in the pathophysiology of the peritoneal membrane. Chronic inflammation led to increased hyaluronic acid synthesis, with native hyaluronic acid exerting protective effects, while hyaluronic acid fragments (due to depolymerisation) exacerbated inflammatory and fibrotic processes. The study highlights the dual role of hyaluronic acid depending on molecular weight and context but provides no direct evidence regarding the effects of oral supplements ⁹.

HYPOTHESIS The studies suggest an anti-inflammatory potential of oral hyaluronic acid, particularly in systemic or local inflammatory processes, as indicated by changes in biomarkers. The effects appear to be dose-dependent (60–120 mg/day) and potentially linked to molecular weight. It remains unclear whether the observed biomarker changes translate into clinically relevant endpoints (e.g., pain reduction) in humans.

Skin

A randomised, double-blind clinical trial involving 129 female participants investigated the effects of oral hyaluronic acid on skin parameters. Participants were stratified into younger and older groups as well as by skin type. After 2–8 weeks, a significant improvement in skin hydration was observed; after 4–8 weeks, skin tone lightening was noted; and after 12 weeks, an increase in epidermal thickness was recorded. The study showed effects of oral hyaluronic acid in skincare, though details on dosage and molecular size of the hyaluronic acid used, as well as long-term effects, are lacking ⁴.

A prospective, randomised study involving 54 patients with dry eye disease (DED) examined the effects of combined oral and topical hyaluronic acid. The study group ($n=24$) showed significant improvements after 1 and 3 months in the *Ocular Surface Disease Index* (OSDI; baseline: 61.8 ± 16.2 ; 3 months: 42.3 ± 9.1 ; $P < 0.001$), tear film break-up time (TBUT; baseline: 4.2 ± 1.1 ; 3 months: 4.7 ± 1.1 ; $P < 0.012$), and corneal fluorescein staining (CFS; baseline: 1.8 ± 1.0 ; 3 months: 0.8 ± 0.7 ; $P < 0.001$). The study suggests an additive effect of the combined therapy in DED, though the specific contribution of oral hyaluronic acid alone remains unclear, as do its effects without concomitant topical therapy or optimal dosage ⁵.

HYPOTHESIS The studies demonstrate consistent effects of oral hyaluronic acid on skin hydration, tone, and thickness. In combined therapy with topical hyaluronic acid, improvements in ocular surface parameters were observed. The mechanisms of action may involve systemic provision of hyaluronic acid precursors or modulation of the extracellular matrix. It remains unclear whether the effects are dose-dependent, whether they persist with prolonged use, and whether oral hyaluronic acid alone produces similar effects in humans.

Further Investigations

A randomised, placebo-controlled preclinical study involving 10 Asian small-clawed otters (*Aonyx cinerea*) and 2 African spotted-necked otters (*Hydrictis maculicollis*) with radiologically confirmed osteoarthritis examined the effects of oral hyaluronic acid (loading dose: 4 mg/kg/day for 10 days, maintenance dose: 2 mg/kg/day for 20 days). Evaluation of mobility questionnaires (*Otter Mobility Assessment*, OMA) and clinical lameness scores revealed no significant differences between the hyaluronic acid and placebo groups. The study shows that hyaluronic acid at the dosage used is safe in otters but provides no evidence of efficacy for osteoarthritis in this species; effects in humans remain uninvestigated⁶.

Observational studies on hyaluronic acid-enriched transfer medium (*EmbryoGlue*) in in vitro fertilisation (IVF) do not address oral hyaluronic acid.

HYPOTHESIS Preclinical studies (e.g., animal models of osteoarthritis) suggest that hyaluronic acid may have effects in specific contexts. However, these findings are not yet confirmed in humans, and the evidence for systemic effects following oral administration remains preliminary.

Overall Picture

The available studies show that oral hyaluronic acid has been investigated for joint complaints, inflammatory processes, and skin ageing. Effects are often modest, dose-dependent, and sometimes limited to specific subgroups (e.g., younger osteoarthritis patients). Some studies report improvements in clinical scores (e.g., WOMAC, JKOM) or changes in biomarkers (e.g., CRP, IL-1 β), but a relevance of these biomarker changes for clinical outcomes remains to be clarified. A clear dose-response relationship or differentiation between symptomatic and structural effects is frequently lacking.

The evidence remains incomplete in many areas: there are few long-term studies (>12 months), no systematic comparisons of different molecular weights or formulations (e.g., native vs. hydrolysed hyaluronic acid), and only a limited number of studies with hard clinical endpoints (e.g., joint space narrowing, avoidance of surgery). Furthermore, most studies involve small populations, and placebo effects or concomitant therapies (e.g., exercise) may influence the results.

Methodology of the Evidence Base

["Studies on oral hyaluronic acid often employ randomised, double-blind, placebo-controlled designs with typical durations ranging from 8 weeks to 12 months. Endpoints frequently include clinical scores (e.g., WOMAC, JKOM, OSDI), subjective parameters (e.g., pain scales), or biomarkers (e.g., inflammatory cytokines, hyaluronic acid turnover rates). Some studies combine clinical assessments with imaging or laboratory analyses (e.g., synovial fluid examinations, D₂O labelling), while others rely solely on subjective questionnaires. However, comparisons with established therapies (e.g., NSAIDs, intra-articular injections) are often lacking."]

Oral Hyaluronic Acid: Local Effect or Systemic Action?

The assumption that oral hyaluronic acid acts

SYSTEMICALLY

is widespread but not supported by the available data. Most human studies demonstrate effects in **localised areas** such as joints or skin without evidence of increased hyaluronic acid concentrations in blood or tissues. Fragmentation in the gut may explain why **no direct tissue effect** is measurable. Instead, **indirect mechanisms** are discussed, such as modulation of the gut barrier or microbiome.

The

MOST FREQUENTLY CITED STUDIES

report **symptomatic improvements** rather than structural changes. Whether these effects are attributable to hyaluronic acid itself or to **accompanying substances** (e.g., in rooster comb extracts) remains unclear. The **lack of a dose-response relationship** within the studied dosage ranges suggests either the existence of a **threshold** or that the effect is **non-specific**. The most recent study on immune responses may provide new insights in this regard.

3. How Robust the Research Is

Human studies comprise **observational** and **controlled** designs. Controlled trials primarily focus on **knee osteoarthritis** and **skin ageing**, followed by inflammatory markers and immune parameters. Review articles discuss mechanisms based on preclinical findings. The most cited human studies, published between 2008 and 2015, showed **pain reduction** and **functional improvement** in osteoarthritis.

The methodological strength lies in the **double-blind, placebo-controlled** osteoarthritis studies lasting up to 12 months. Weaknesses include the **heterogeneous molecular sizes** of the preparations used and the **lack of standardisation** in measurement methods. Many studies rely on **subjective scores** (e.g., WOMAC) or **laboratory parameters** of unclear clinical relevance. The most recent study is the first to investigate **systemic immune and metabolic responses** but remains isolated.

4. What Is Frequently Claimed — and What the Data Show

STATEMENT	EVIDENCE BASE
Oral hyaluronic acid improves skin hydration.	Controlled studies demonstrate subjective improvements (e.g., reduction of wrinkles), but no objective measurements of skin hydration or elasticity. The data is insufficient for a classification.
Oral hyaluronic acid has anti-inflammatory effects.	Controlled studies examine inflammatory markers in specific contexts (osteoarthritis, obesity). A general anti-inflammatory effect has not been proven. The data is insufficient for a classification.
Oral hyaluronic acid supports joint health in healthy individuals.	All controlled studies on joints were conducted in patients with osteoarthritis . There are no data on preventive effects in healthy individuals.
Oral hyaluronic acid is effective for dry eyes.	A pilot study shows preliminary evidence , but no robust results. The data situation is insufficient for a classification.

5. Profile: Molecule and Charge

Oral hyaluronic acid is not a single molecule but a **mixture**—there is no molecular formula or fixed molecular mass. What can be described are functional groups, charge behaviour, and redox properties; this is the focus of the next section.

6. Interactions with Other Substances

Which other substances on this platform have been **jointly** investigated or discussed with this substance in human studies and review articles—whether in combination, comparison, or shared mechanism of action. The number indicates studies in which both appear.

SUBSTANCE	JOINT STUDIES	OF WHICH CONTROLLED IN HUMANS
Glucosamine and chondroitin	34	11
Chronic inflammation	19	3
Collagen	19	5
Turmeric and curcumin	11	1
Omega-3 fatty acids	6	3
Green tea and EGCG	6	2
Frankincense (Boswellia)	6	2
MSM (methylsulfonylmethane)	6	4
Gut microbiome	5	0
Quercetin	5	0

There is currently no direct evidence from controlled human studies on interactions between orally administered hyaluronic acid and medications, nutrients, or other substances. In animal studies (SKH-1 mice), hyaluronic acid was investigated in combination with hydrolysed collagen without any interactions with enzyme systems such as CYP or absorption mechanisms being described ^{18 19}. The studies focused on anti-inflammatory and matrix-protective effects under UV exposure, not on pharmacokinetic interactions. Whether hyaluronic acid affects the absorption or efficacy of other substances remains unclear. Potential binding effects to orally ingested substances or modulation of transport proteins have not been documented.

In a controlled human study (patients ≤ 70 years with knee osteoarthritis), symptomatic improvement was observed with oral hyaluronic acid *in combination* with physiotherapeutic exercises¹. Whether this is due to a direct interaction with nutrients or an indirect enhancement of the training effect was not analysed. Data on CYP enzymes, drug metabolism, or absorption competition are lacking. Since hyaluronic acid is degraded in the gut by hyaluronidases, substances that influence these enzymes (e.g., certain polyphenols) could theoretically alter bioavailability. Systematic investigations on this are lacking.

7. Overdose, Tolerability, and Limitations

Human observational data on oral hyaluronic acid suggest a low risk of adverse effects. Dose specifications or upper limits for toxicity are not provided in the available evidence. However, systemic agents and oral supplements in general can have adverse effects without specific doses being identified²⁰. No animal or laboratory studies on toxicity or overdose are available.

No contraindications or absolute restrictions for oral hyaluronic acid are described in the available evidence. However, the data on long-term safety or dose-response relationships for oral administration are limited. Whether interactions with other substances or specific patient groups (e.g., those with renal or hepatic impairment) pose a risk was not examined in the cited studies. Further clinical studies would be necessary to assess upper limits or cumulative toxicity.

8. The Most Robust Studies

Ranked by evidence strength, not by popularity. The full evaluation includes significantly more studies; only the most robust are listed here.

Controlled Human Studies

- ¹ Oral administration of polymer hyaluronic acid alleviates symptoms of knee osteoarthritis: a double-blind, placebo-controlled study over a 12-month period (2012)
- ² Effect of a natural extract of chicken combs with a high content of hyaluronic acid (Hyal-Joint) on pain relief and quality of life in subjects with knee osteoarthritis: a randomised, double-blind, placebo-controlled trial (2008)
- ³ The effects of an oral preparation containing hyaluronic acid (Oralvisc®) on obese patients with knee osteoarthritis as determined by pain, function, and bradykinin levels: a randomised, double-blind, placebo-controlled trial (2015)
- ⁴ Oral administration of hyaluronic acid to improve skin conditions: a randomised, double-blind clinical trial (2023)
- ⁵ Oral Hyaluronic Acid Supplementation for the Treatment of Dry Eye Disease: A Pilot Study (2019)
- ⁶ Development of a mobility assessment score for evaluation of the effects of oral hyaluronic acid on clinical lameness in Asian small-clawed otters (*Aonyx cinereus*): a pilot study (2022)
- ⁷ Embryo Glue: The Use of Hyaluronan in Embryo Transfer Media (2021)
- ⁸ Systemic responses to oral hyaluronic acid: A clinical randomised placebo-controlled study of plasma immune and metabolomic responses (2026)

Observational Human Studies

- ⁹ Pathophysiology of the peritoneal membrane during peritoneal dialysis: the role of hyaluronan (2011)
- ¹⁰ Roles of hyaluronan in cardiovascular and nervous system disorders (2019)
- ¹¹ Increased concentration of hyaluronan in tears after soaking contact lenses in Biotrue multipurpose solution (2016)
- Oral Supplementation and Systemic Drugs for Skin Ageing: A Narrative Review (2023)
- ¹² Hyaluronan-enriched transfer medium (HETM) can improve the implantation rate in morphologically poor euploid blastocyst transfer (2023)
- ¹³ Effect of Hyaluronic Acid-Enriched Media in Embryo Implantation (2022)
- ¹⁴ Oral Hyaluronic Acid in Osteoarthritis and Low Back Pain: A Systematic Review (2024)
- ¹⁵ Short-term results of curcumin, quercetin, hyaluronic acid and chondroitin sulfate (Ialuril Soft Gels®) in the management of chronic prostatitis/chronic pelvic pain syndrome: a pilot study (2025)
- ¹⁶ Clinical outcomes in adult subjects with aphthous stomatitis treated with an oral hyaluronic acid-based medical device: a pilot study (2022)

Human Tissue Studies

- ¹⁷ In vitro and ex vivo analysis of hyaluronan supplementation of Integra® dermal template on human dermal fibroblasts and keratinocytes (2016)

9. Summary

1) **What is evidenced:** Oral hyaluronic acid demonstrates symptomatic effects in controlled studies for knee osteoarthritis (pain reduction, functional improvement) and skin ageing (hydration, tone, epidermal thickness). Inflammatory markers such as IL-6, TNF- α , and CRP showed reductions in specific contexts (osteoarthritis, obesity), though their clinical relevance remains unclear. The methodologically strongest studies are double-blind, placebo-controlled, and conducted over 3–12 months. However, many results rely on subjective scores (e.g., WOMAC, JKOM) or surrogate parameters, while

structural or radiological changes have not been demonstrated. The effects are often moderate and limited to subgroups (e.g., younger osteoarthritis patients). Bioavailability and the mechanism of action remain unclear, as hyaluronic acid is fragmented in the gut and no systemic tissue elevation is measurable.

2) **What is plausible and its potential implications (hypotheses):** **Hypothesis:** The observed effects may stem from indirect mechanisms, such as modulation of the gut barrier, microbiome, or local inflammatory processes, rather than direct systemic delivery of hyaluronic acid. The inflammation-modulating effects (e.g., reduction of IL-6, TNF- α) suggest potential for chronic inflammatory conditions, though data on clinically relevant endpoints are lacking. **Hypothesis:** Combination with exercise therapy appears to enhance efficacy in osteoarthritis, indicating synergistic effects. **Hypothesis:** The skin and joint effects may result from the provision of precursors for the extracellular matrix, which are reassembled locally in tissues. However, the absence of a dose-response relationship suggests non-specific or threshold-dependent mechanisms.

3) **What a study would need to clarify:** A systematic investigation of the dose-response relationship using standardised hyaluronic acid preparations (defined molecular weight, native vs. hydrolysed forms) would be necessary to identify optimal dosages and formulations. Long-term studies (>12 months) with hard clinical endpoints (e.g., joint space narrowing, avoidance of surgery) and imaging techniques (MRI, ultrasound) could distinguish structural effects from symptomatic ones. Furthermore, studies should clarify the systemic bioavailability and tissue distribution of hyaluronic acid fragments following oral administration to understand indirect mechanisms (e.g., gut microbiome interactions). Comparative studies with established therapies (e.g., NSAIDs, intra-articular injections) would help contextualise the clinical relevance of the observed effects. Finally, preventive studies in healthy individuals would be useful to evaluate potential applications beyond symptomatic treatment.

10. Unresolved Questions

- **Molecular size:** The fragment size that exerts systemic effects after oral intake remains unknown.
- **Long-term effects:** There are no studies on oral hyaluronic acid lasting **more than 12 months**.
- **Mechanism:** It remains unclear whether the effect is due to **direct tissue effects** or **indirect modulation** (e.g., gut microbiome).

11. Further Paths

Topics, mechanisms, and pathways involving this substance—for those who wish to explore beyond the substance itself.

- Interaction network

Topics, mechanisms and chains in which this substance appears — for those who want to look beyond the substance.

Frequently Asked Questions

Can oral hyaluronic acid replace injectable preparations?

No. The evidence shows **no comparable effects**. Injectable hyaluronic acid acts **locally and directly** within the joint, whereas oral administration is **systemically fragmented**. The controlled studies on oral hyaluronic acid examine **symptomatic improvements**, not structural changes. Replacement is **not supported by data**.

Are there differences between hyaluronic acid derived from rooster combs and bacterial fermentation?

The evidence **does not permit any conclusions** regarding differences. Most studies use **rooster comb extracts** without comparing the **molecular composition**. Bacterial hyaluronic acid is investigated in **basic research** but not in controlled human trials. Whether **co-occurring substances** (e.g., proteins) in rooster comb extracts play a role remains unclear.

Can oral hyaluronic acid be used in autoimmune diseases?

There are **no controlled studies** on autoimmune diseases. Two studies examine **immune parameters** in osteoarthritis and obesity but show **no specific effects** on autoimmune processes. The evidence base is **too limited** to justify its use. Laboratory findings on **cytokine modulation** cannot be extrapolated to clinical practice.

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International Health Research

Research, put in context. Every statement leads to the original paper; the decision in the individual case rests with the treating professional.
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