Integrative medicine management .
in Long COVID

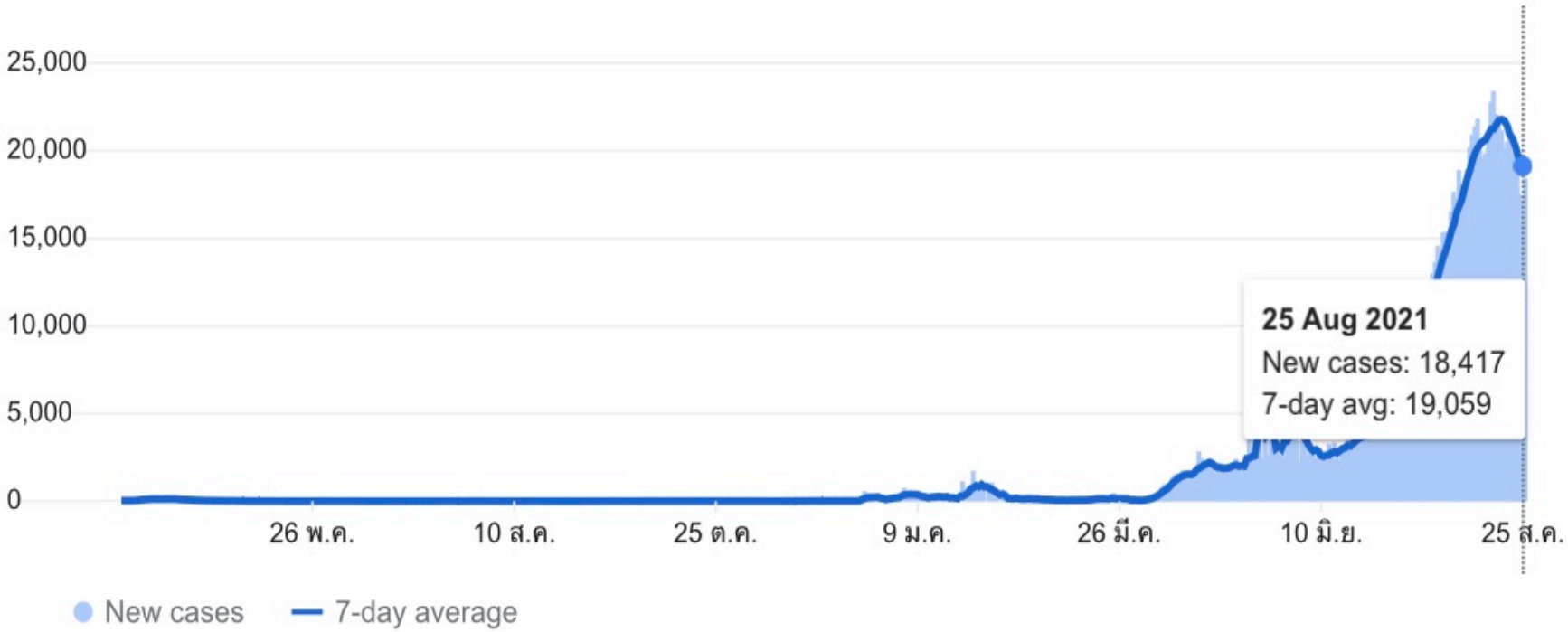
Sitt,MD.

สถิติ

New cases | Deaths | Vaccinations | Tests

From JHU CSSE COVID-19 Data · Last updated: 1 วันที่ผ่านมา

ประเทศไทย | All time



Each day shows new cases reported since the previous day · About this data

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สถิติ

New cases | **Deaths** | Vaccinations | Tests

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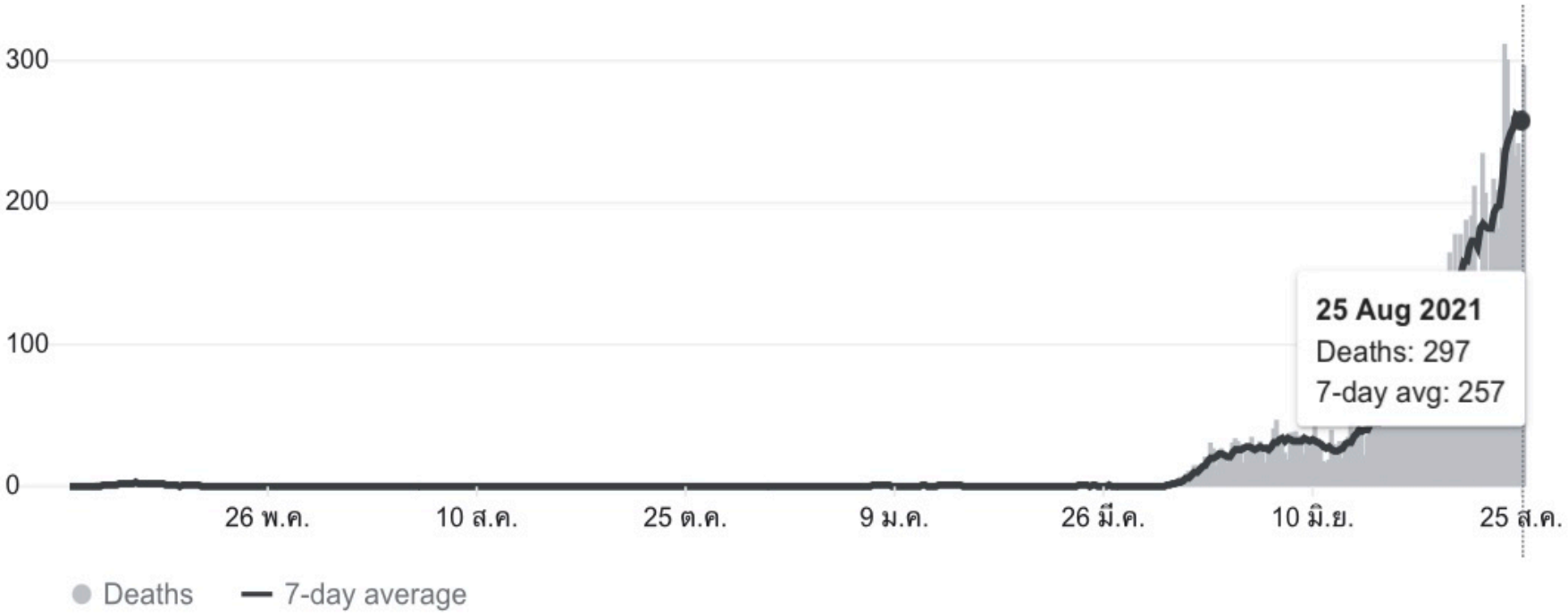

Each day shows deaths reported since the previous day · About this data

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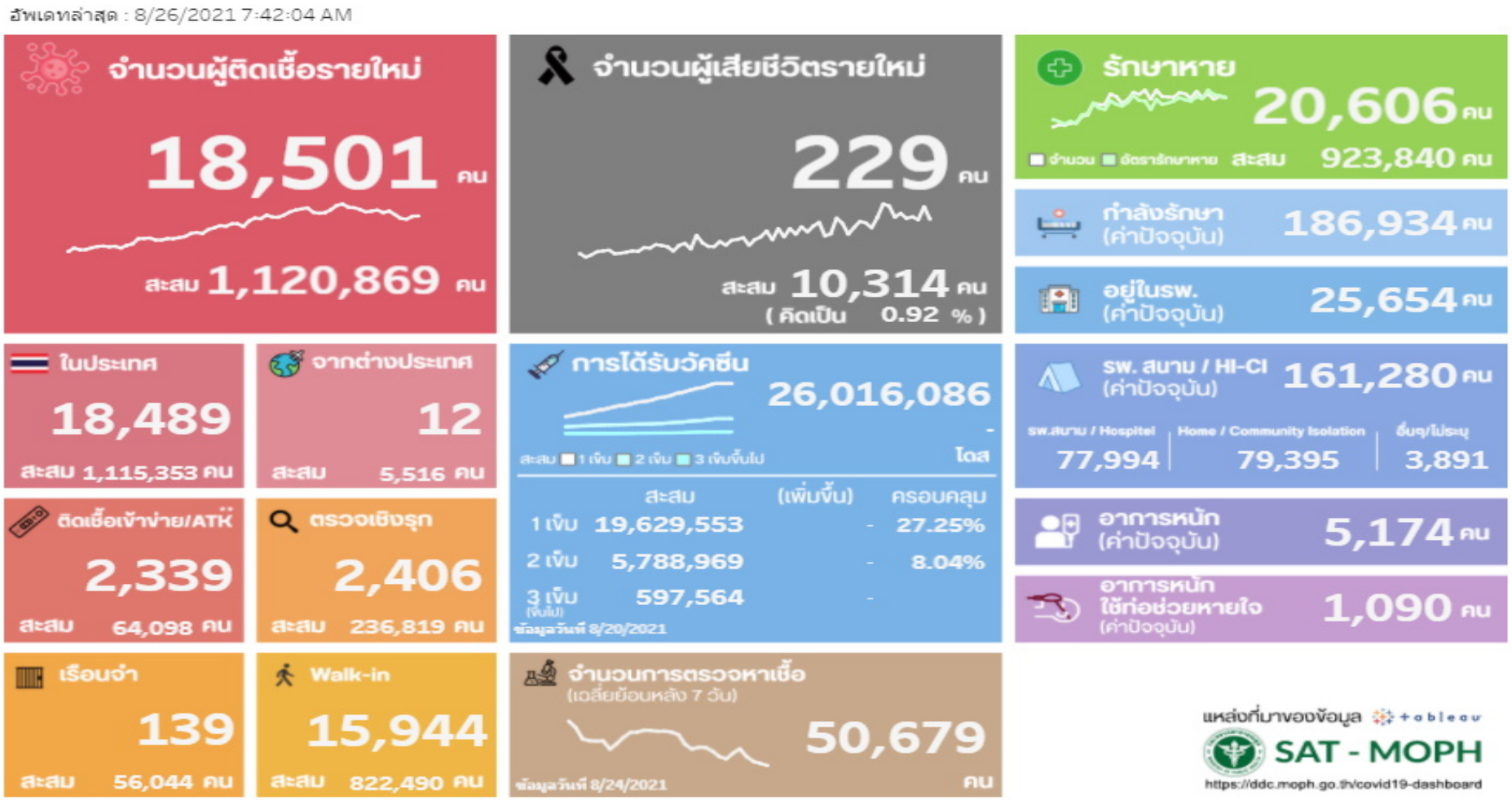

- ข้อมูลจากทั่วประเทศคงเหลือผู้ป่วยระหว่างการรักษา 186,934 คน แบ่งเป็นผู้ป่วยในโรงพยาบาล 25,654 คน ในจำนวนนี้เป็น**ผู้ป่วยปอดอักเสบอาการหนัก 5,174 คน** โคม่าต้องใส่ท่อช่วยหายใจ 1,090 คน ส่วนผู้ป่วยอีก 161,280 คน แยกรักษาใน รพ.สนาม 77,994 คน กักตัวรักษาที่บ้านหรือที่ชุมชน 79,395 คน และรักษาในระบบอื่นๆ 3,891 คน

ขณะเดียวกัน วันนี้มีรายงานผู้เสียชีวิตเพิ่มอีก 229 คน ผู้เสียชีวิตสะสม 10,314 คน อัตราการเสียชีวิตในประเทศไทย 0.92%

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Large community-based study involving over half a million adults in England analyzes persistent symptoms following SARS-CoV-2 infection

- UK-based researchers recently conducted a community-based study among more than half a million people; it was designed to be representative of the adult population in England. A random sample of adults 18 years and above who were registered with a GP were invited to participate in the study regardless of previous access to COVID-19 services to provide an estimate of population prevalence representative of the whole population.
- Using rounds 3–5 of the REACT-2 study, a total of **508,707** people in the community in England were surveyed about prior history of COVID-19 and the presence and duration of 29 related symptoms. They used uni- and multivariable models to identify predictors of symptom persistence at 12 weeks or beyond.

Persistent symptoms following SARS-CoV-2 infection in a random community sample of 508,707 people Matthew Whitaker, Joshua Elliott, Marc Chadeau-Hyam, Steven Riley, Ara Darzi, Graham Cooke, Helen Ward, Paul Elliott, medRxiv, 2021.06.28.21259452;

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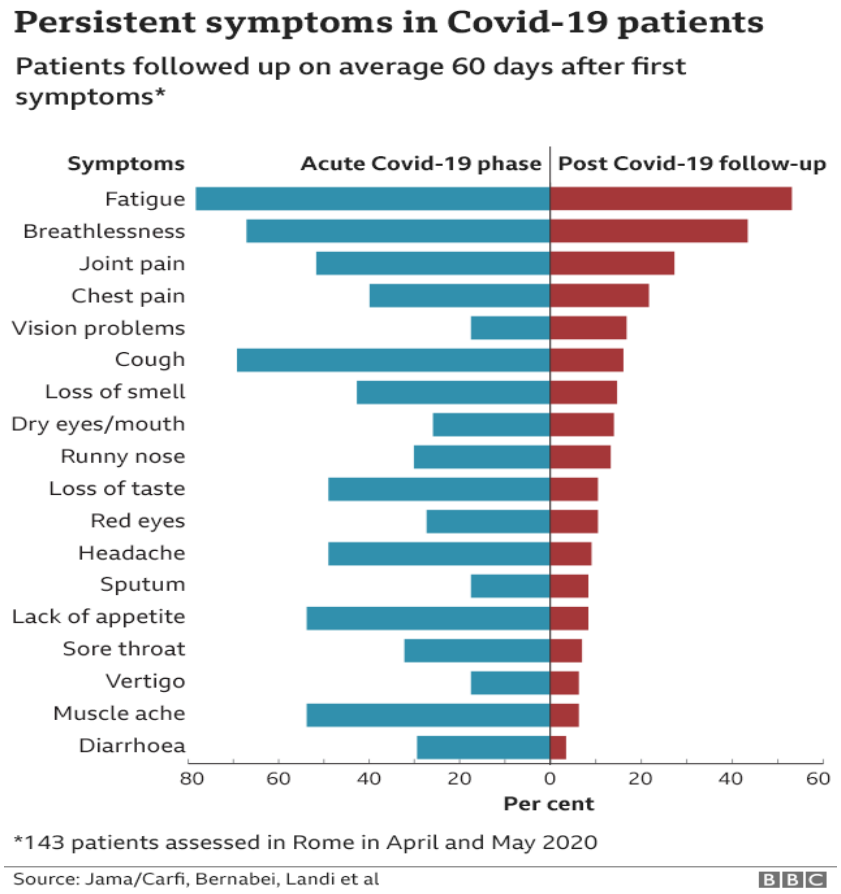
Long Covid - Covid Long haul or Post Covid syndrome



- Long COVID-19 may be defined as patients who, four weeks after the diagnosis of SARS-Cov-2 infection, continue to have signs and symptoms not explainable by other causes.
- The frequency of long COVID-19 ranged from 4.7% to 80%

1. Raveendran AV. Long COVID-19: Challenges in the diagnosis and proposed diagnostic criteria. Diabetes Metab Syndr. 2021 Jan-Feb;15(1):145-146. doi: 10.1016/j.dsx.2020.12.025. Epub 2020 Dec 15.
2. Sisó-Almirall A, Brito-Zerón P, Conangla Ferrín L, Kostov B, Moragas Moreno A, Mestres J, Sellarès J, Galindo G, Morera R, Basora J, Trilla A, Ramos-Casals M, On Behalf Of The CAMFiC Long Covid-Study Group. Long Covid-19: Proposed Primary Care Clinical Guidelines for Diagnosis and Disease Management. Int J Environ Res Public Health. 2021 Apr 20;18(8):4350.
3. Cabrera Martimbianco AL, Pacheco RL, Bagattini ÂM, Riera R. Frequency, signs and symptoms, and criteria adopted for long COVID-19: A systematic review. Int J Clin Pract. 2021 May 11:e14357. doi: 10.1111/ijcp.14357. Epub ahead of print.

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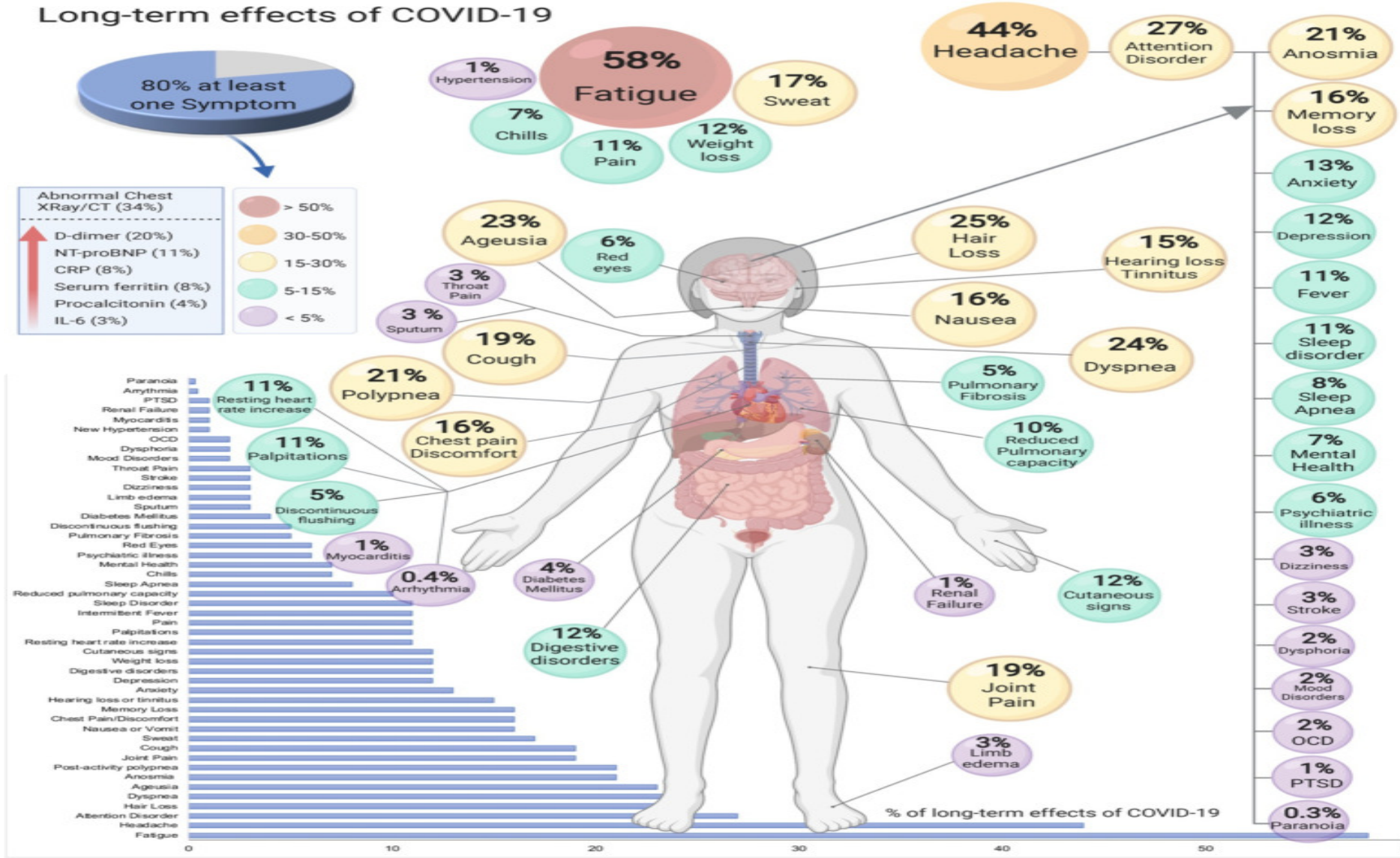
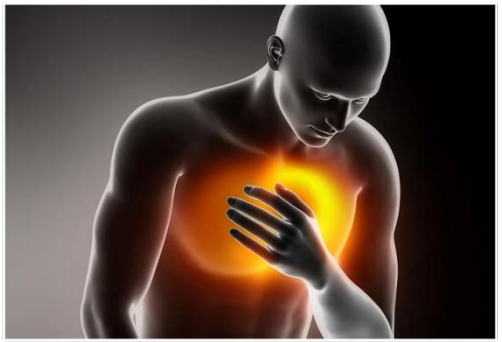
The five most common symptoms were fatigue (58%), headache (44%), attention disorder (27%), hair loss (25%), and dyspnea (24%).



Lopez-Leon S, Wegman-Ostrosky T, Perelman C, Sepulveda R, Rebolledo PA, Cuapio A, Villapol S. More than 50 Long-term effects of COVID-19: ***a systematic review and meta-analysis***. medRxiv [Preprint]. 2021 Jan 30:2021.01.27.21250617.

Anosmia(21%) : ภาวะจมูกไม่ได้กลิ่น

Agusia (21%) : ภาวะสูญเสียการรับรส



Chest pain & Chest discomforte (16%) :

อาการเจ็บแน่นหน้าอก หายใจไม่เต็มปอด

Anxiety (13%): วิตกกังวล

Depression (12%) : ซึมเศร้า

Insomnia (11%) : นอนไม่หลับ

Fibromyalgia & arthalgia(11%) :

อาการปวดเมื่อยตามกล้ามเนื้อ และข้อต่อต่างๆ

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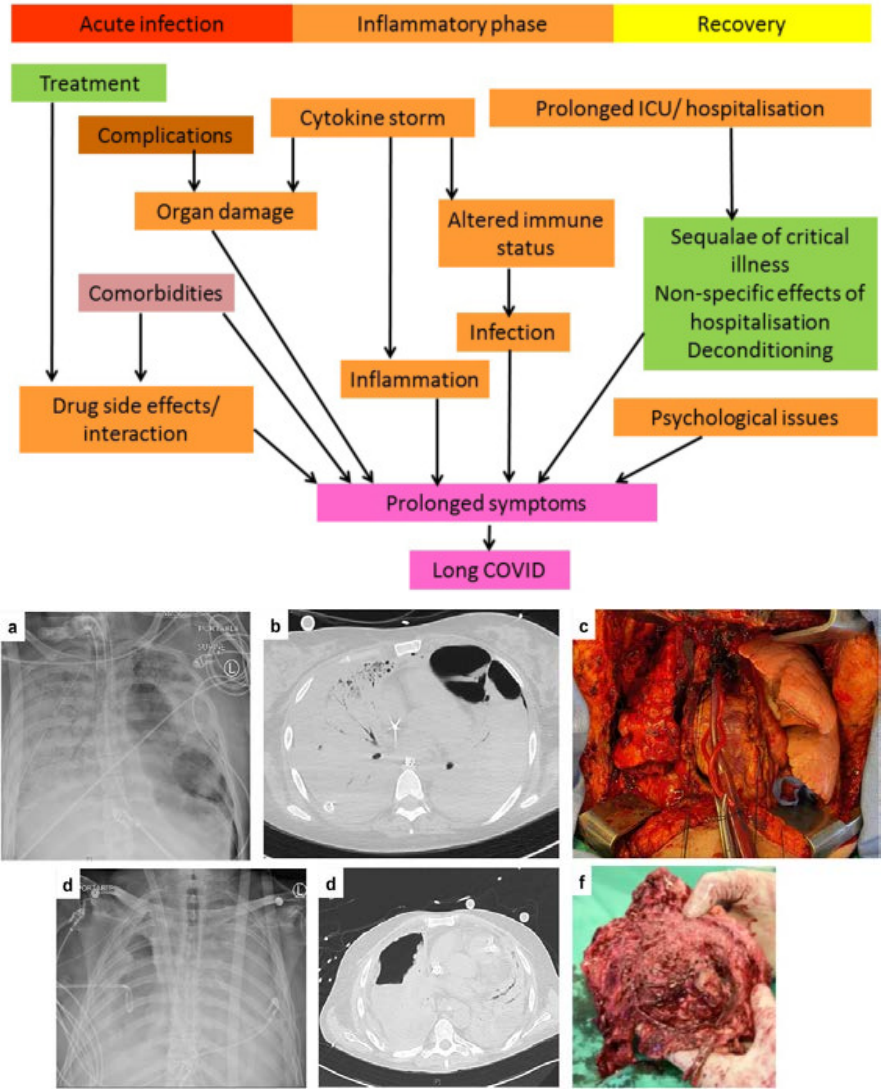
สาเหตุของการเกิด Long Covid



1) **Viral immune mimicry** : ระบบภูมิคุ้มกันเกิดภาวะเสียสมดุลหลังจากการติดเชื้อ **covid-19** ทำให้ร่างกายสร้างระบบภูมิคุ้มกันทำลายเนื้อเยื่อตัวเอง **autoimmunity**
2) **Ongoing viral shedding** : หลังติดเชื้อ **covid-19** แล้วยังมีเศษชิ้นส่วนของไวรัส (**Viral shedding**) อยู่ในร่างกายคนไข้ ทำให้มีการอักเสบเรื้อรังเกิดขึ้นอีก
3) **Chronic inflammation and tissue destruction** : ภาวะที่เนื้อเยื่อต่างๆของร่างกาย อาทิเช่น ปอด เส้นเลือด หัวใจ สมอง ตับ หรือ ไต เกิดการบาดเจ็บและเสื่อมสภาพลงหลังการติดเชื้อ
4) **Adrenal fatigue** : ภาวะที่เกิดการอักเสบ ความเครียด และการใช้ยา **Steroid** ในช่วงการรักษายังส่งผลต่อการทำงานของฮอร์โมนต่อมหมวกไต ซึ่งทำให้เกิดภาวะต่อมหมวกไตล้า
5) **Drug side effect and interaction**

1. https://doi.org/10.1101/2020.10.26.20218636
2. https://doi.org/10.1016/j.dsx.2021.04.007

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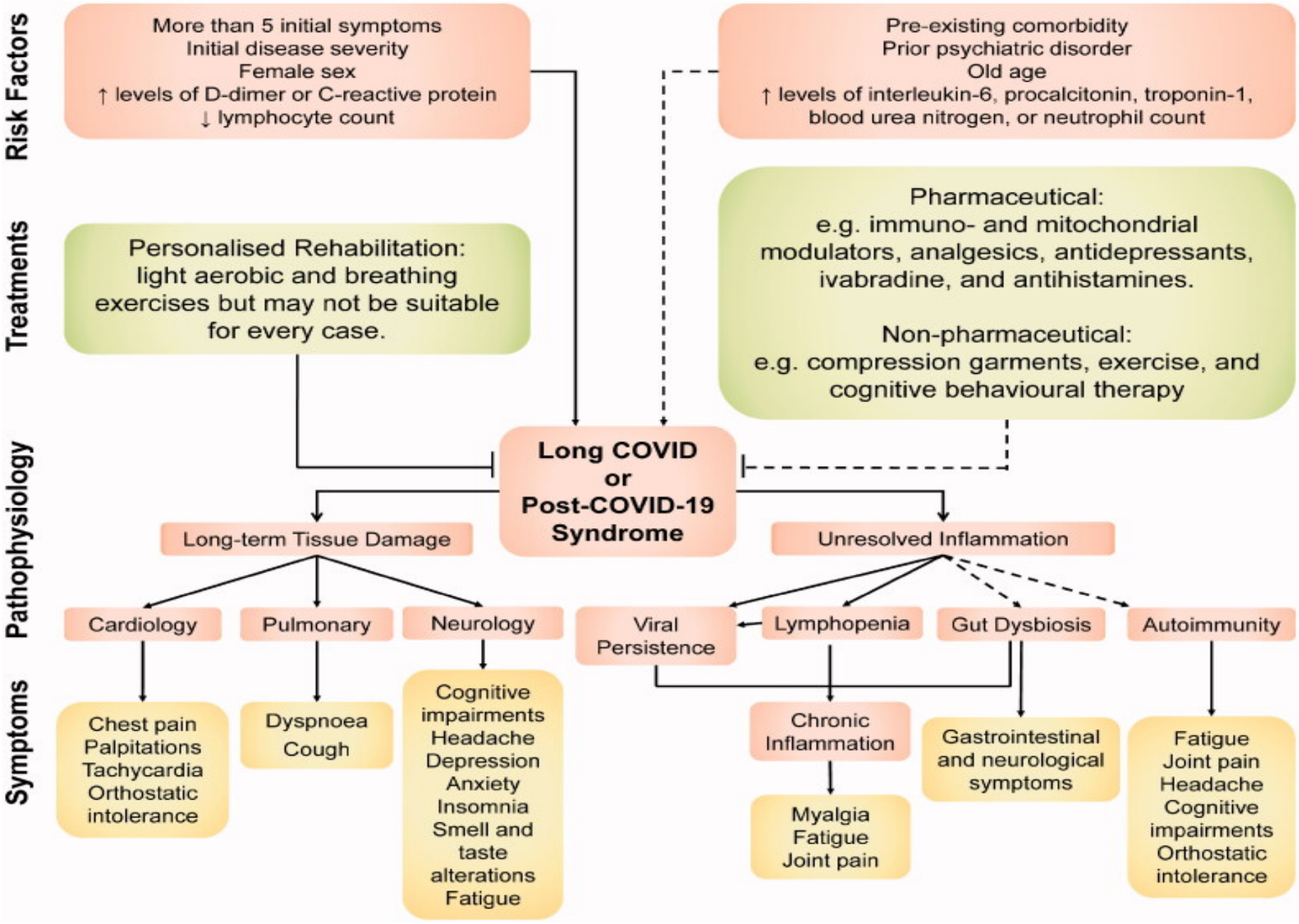

Yong SJ. Long COVID or post-COVID-19 syndrome: putative pathophysiology, risk factors, and treatments. *Infect Dis (Lond)*. 2021;53(10):737-754. doi:10.1080/23744235.2021.1924397

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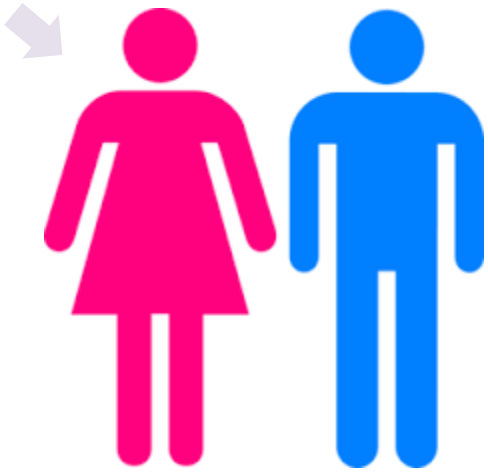
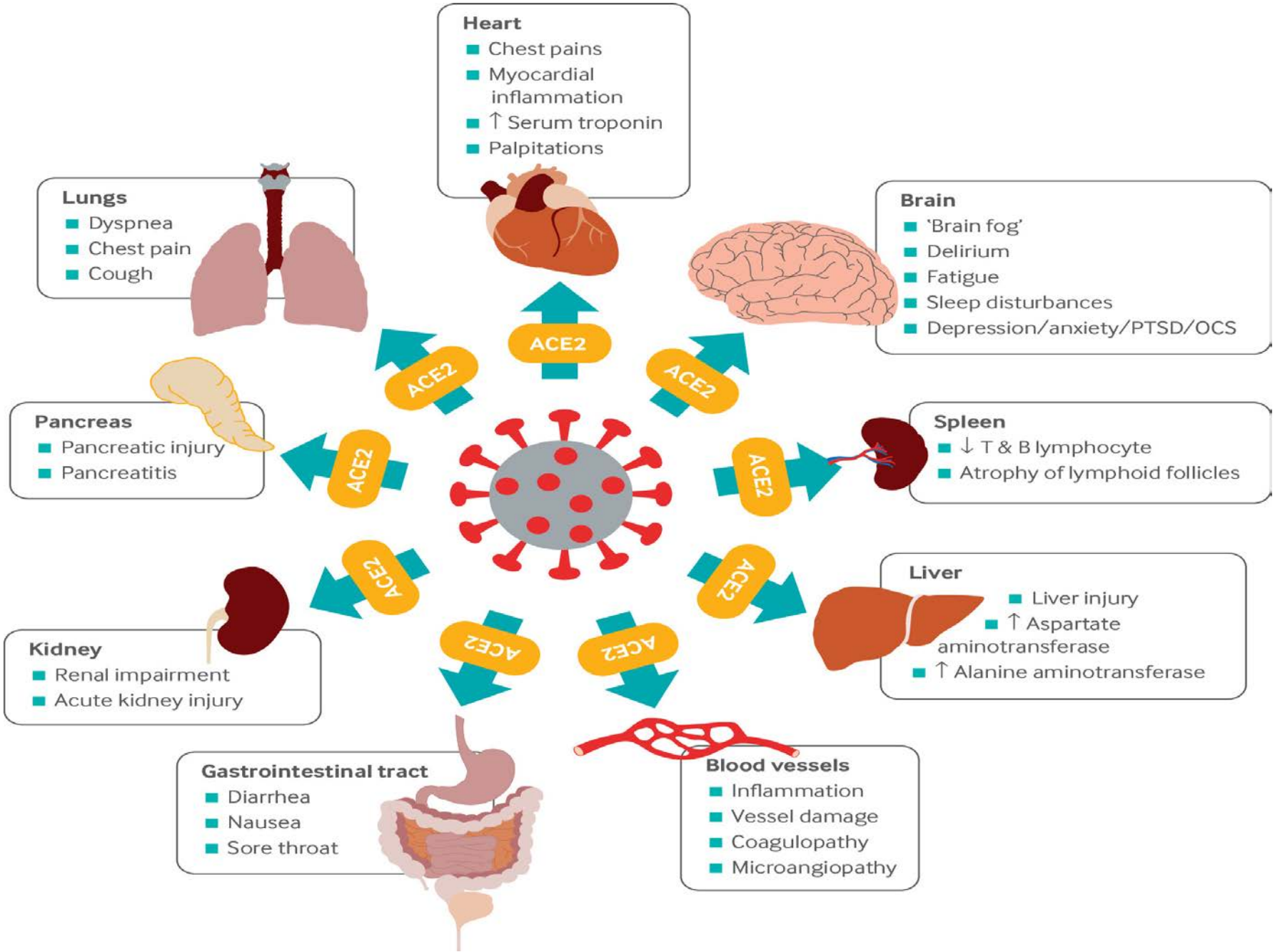
Risk factor of Long COVID



- Age was associated with a linear increase in long COVID between age 20-70. , But the children also can get the Long covid.
- Female > Male
- Poor pre-pandemic mental health
- Poor general health were associated with higher risk of long COVID : asthma ,obesity, diabetes
- Non-white ethnic minority groups had lower 4+ week symptom risk
- Variant of SARS –CoV2
- Free floating Spike protein & ACE2 interaction due to vaccination (May be)
- Genetic predisposing
- **Mast cell activation syndrome (MCS)**

1. https://doi.org/10.1101/2021.06.24.21259277
2. https://www.france24.com/en/health/20210812-young-people-hit-hard-by-long-covid-as-delta-variant-surges
3. Angeli F, Spanevello A, Reboldi G, Visca D, Verdecchia P. SARS-CoV-2 vaccines: Lights and shadows. *Eur J Intern Med*. 2021;88:1-8. doi:10.1016/j.ejim.2021.04.019
4. Afrin LB, Weinstock LB, Molderings GJ. Covid-19 hyperinflammation and post-Covid-19 illness may be rooted in mast cell activation syndrome. *Int J Infect Dis*. 2020;100:327-332. doi:10.1016/j.ijid.2020.09.016



Crook H, Raza S, Nowell J, Young M, Edison P. Long covid—mechanisms, risk factors, and management *BMJ* 2021; 374 :n1648

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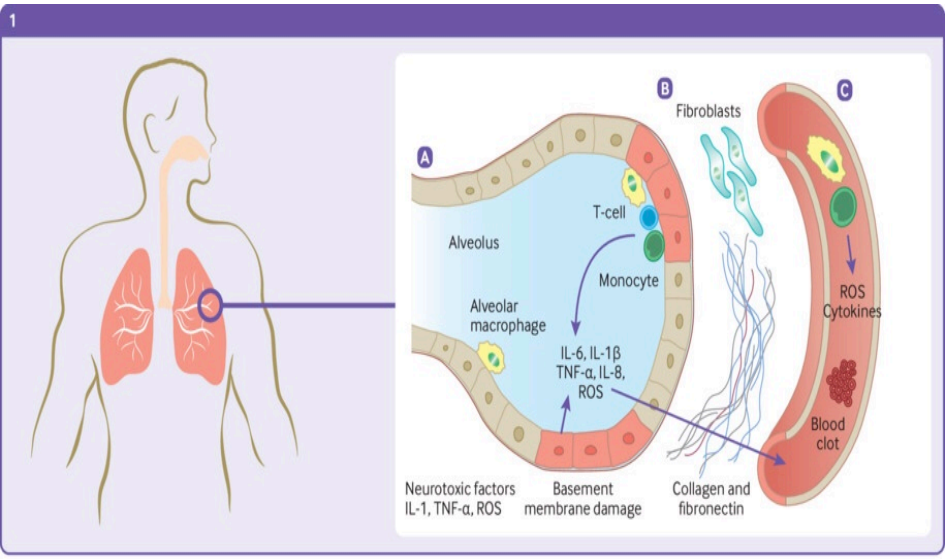

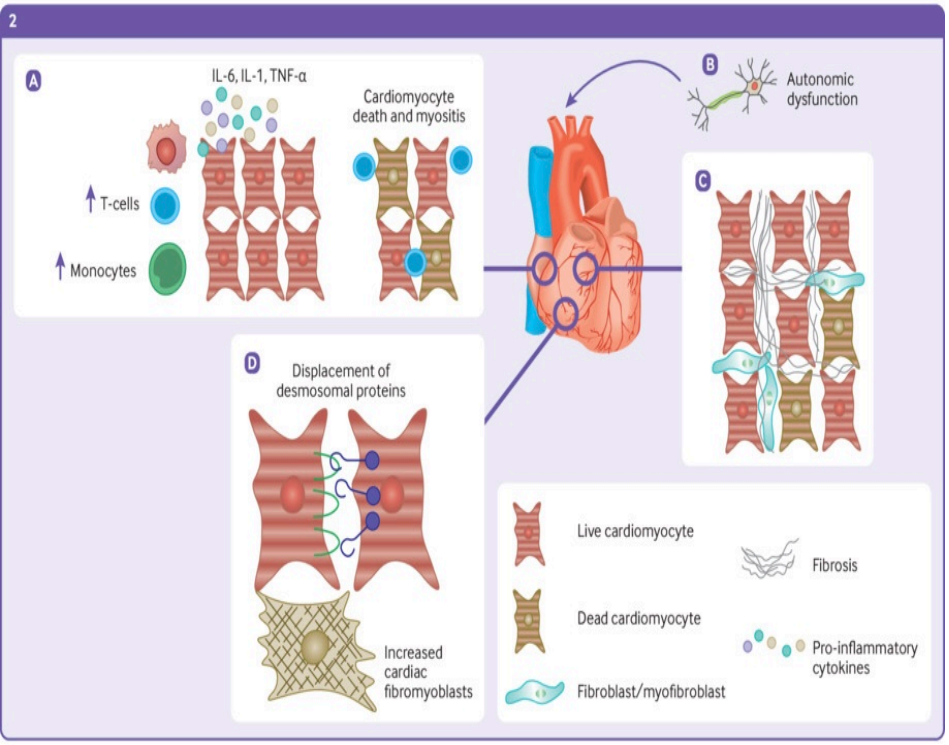

In the alveoli of the lungs :

(A) Chronic inflammation

(B) Endothelial damage triggers the activation of fibroblasts, which deposit collagen and fibronectin resulting in fibrotic changes.

(C) Endothelial injury, pro-inflammatory cytokines, disruption of normal coagulant pathways, and hypoxia may result in the development of a prolonged hyperinflammatory and hypercoagulable state, increasing the risk of thrombosis.

In the heart :

(A) chronic inflammation of cardiomyocytes can result in myositis and cause cardiomyocytes death.

(B) Dysfunction of the afferent autonomic nervous system can cause complications such as postural orthostatic tachycardia syndrome.

(C) Prolonged inflammation, resulting in fibrosis.

(D) Fibrotic changes

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In the central nervous system:

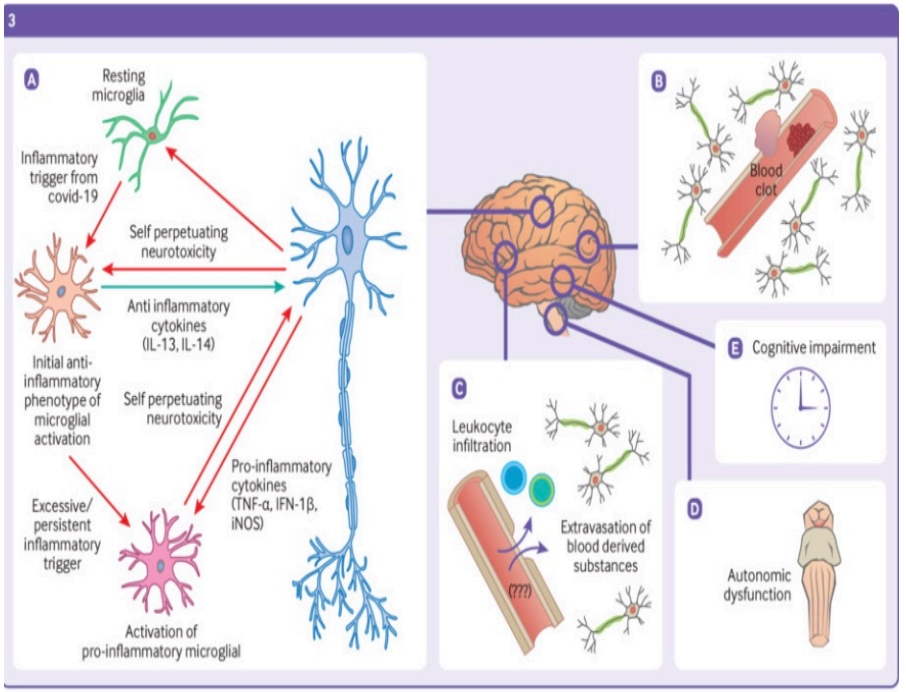
(A) The long term immune response activates glial cells which chronically damage neurons.

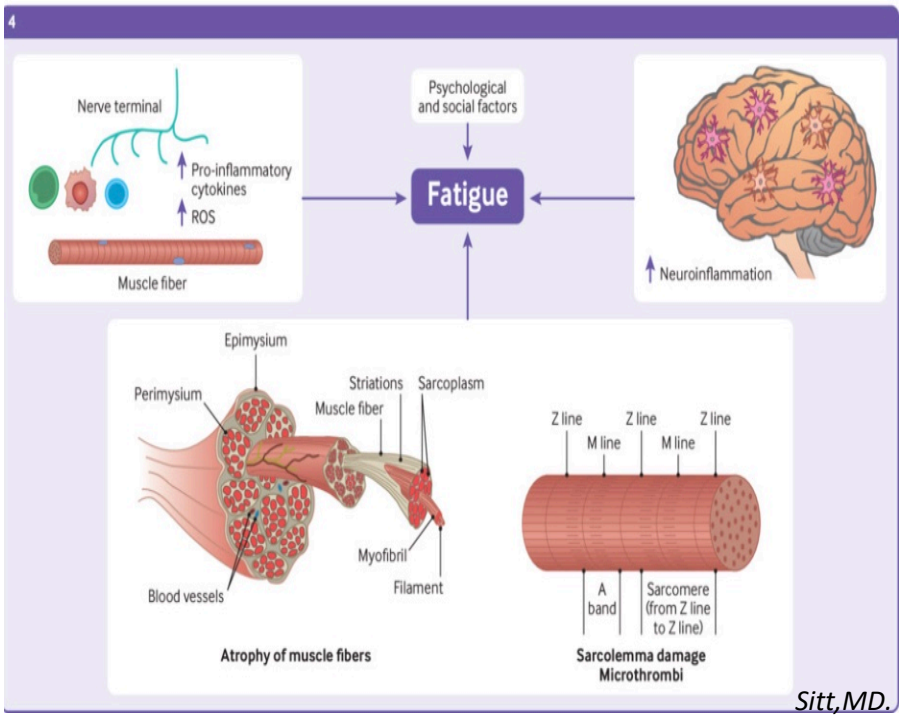
(B) Hyperinflammatory&hypercoagulable states lead to an increased risk of thrombosis.

(C) Blood-brain barrier damage and dysregulation results in pathological permeability, allowing blood derived substances and leukocytes to infiltrate the brain parenchyma.

(D) Chronic inflammation in the brainstem may cause autonomic dysfunction.

(E) The effects of long covid in the brain can lead to cognitive impairment.





Possible mechanisms causing post-covid-19 fatigue.

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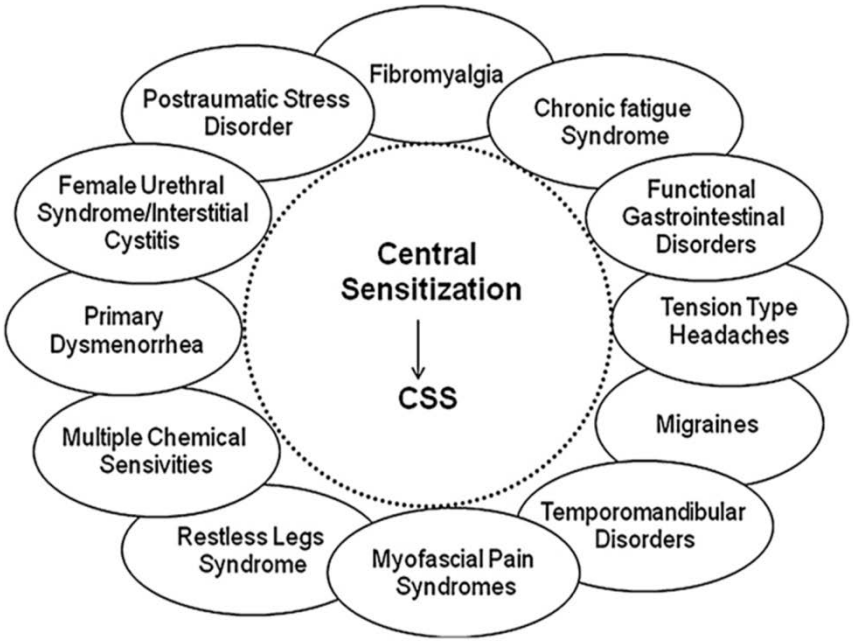
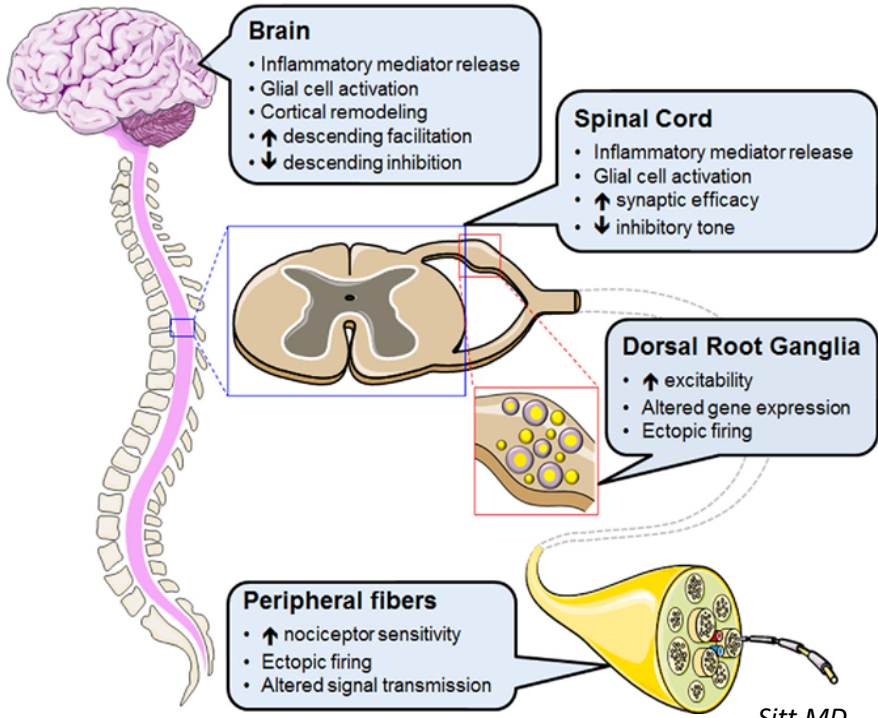
Brain Inflammation

in Chronic Pain, Migraine and Fibromyalgia

The Paradigm-Shifting Guide for Doctors and Patients Dealing with Chronic Pain

Alex Vasquez, D.C., N.D., D.O., F.A.C.N.
ICHNFM.ORG • InflammationMastery.com/pain





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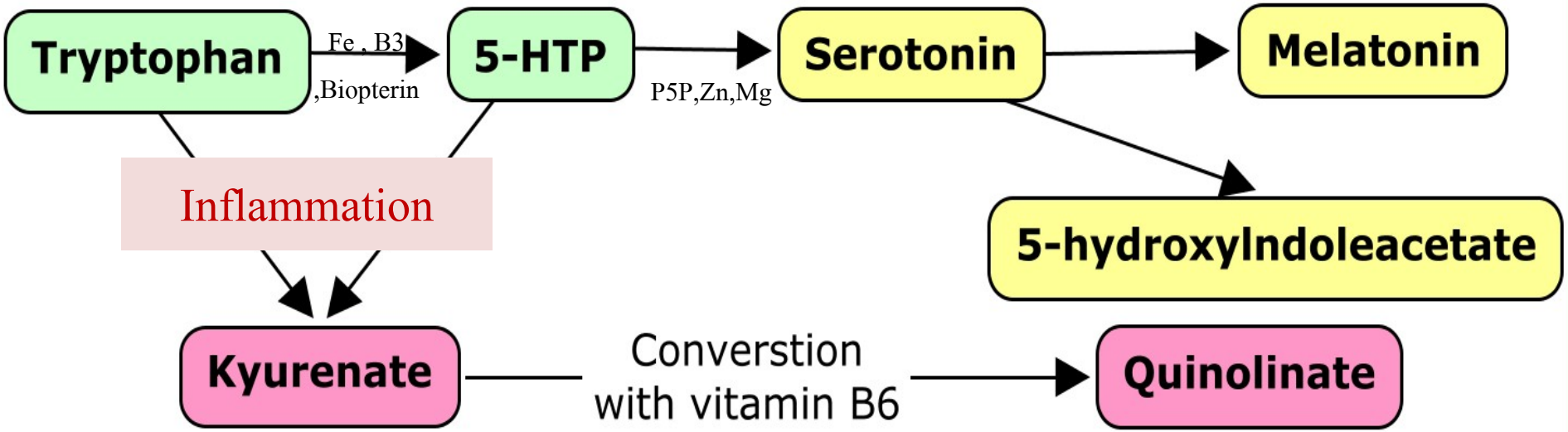
Tryptophan metabolism



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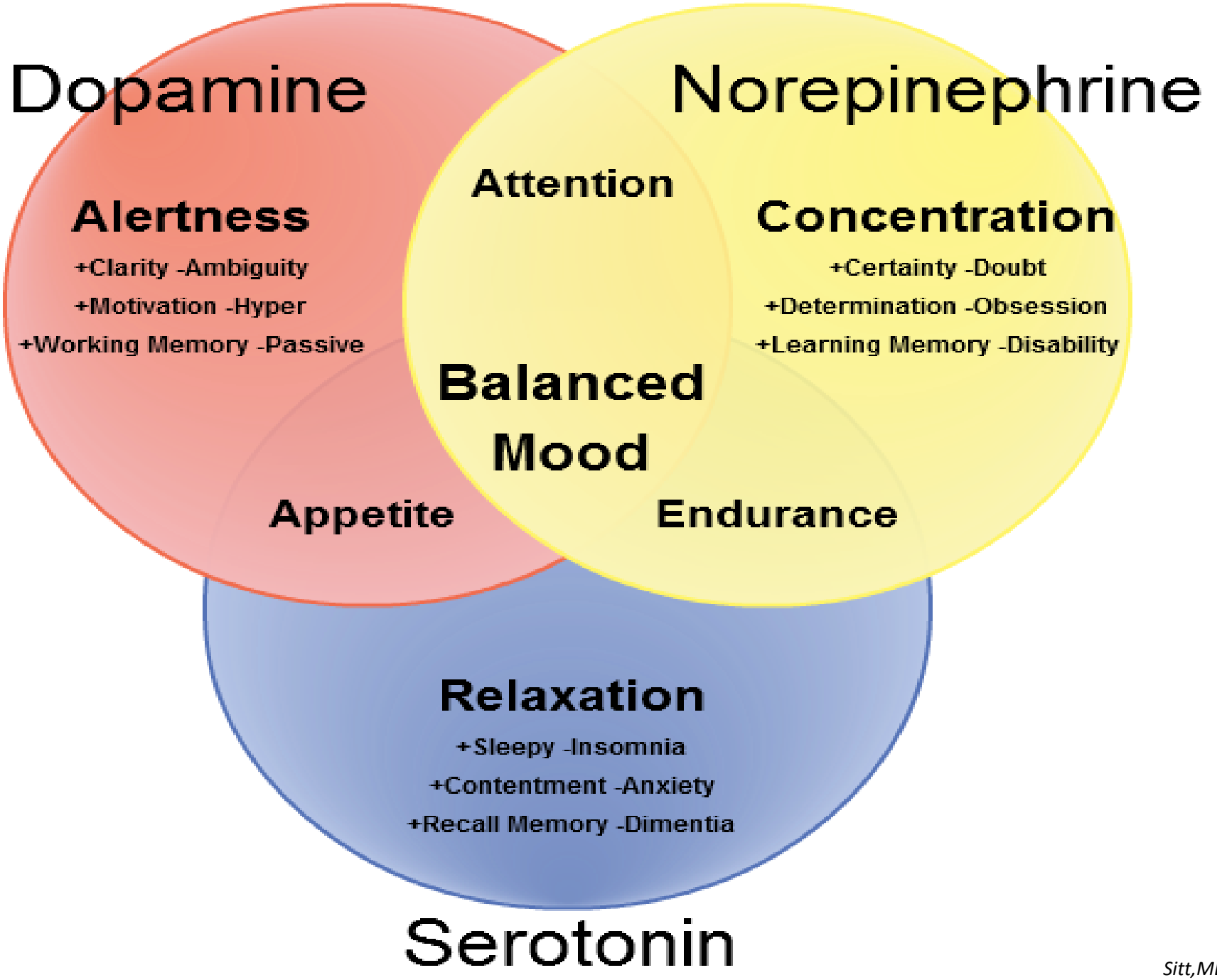
Dopamine
Norepinephrine
Attention
Alertness
+Clarity -Ambiguity
+Motivation -Hyper
+Working Memory -Passive
Concentration
+Certainty -Doubt
+Determination -Obsession
+Learning Memory -Disability
Balanced Mood
Appetite
Endurance
Relaxation
+Sleepy -Insomnia
+Contentment -Anxiety
+Recall Memory -Dimentia
Serotonin

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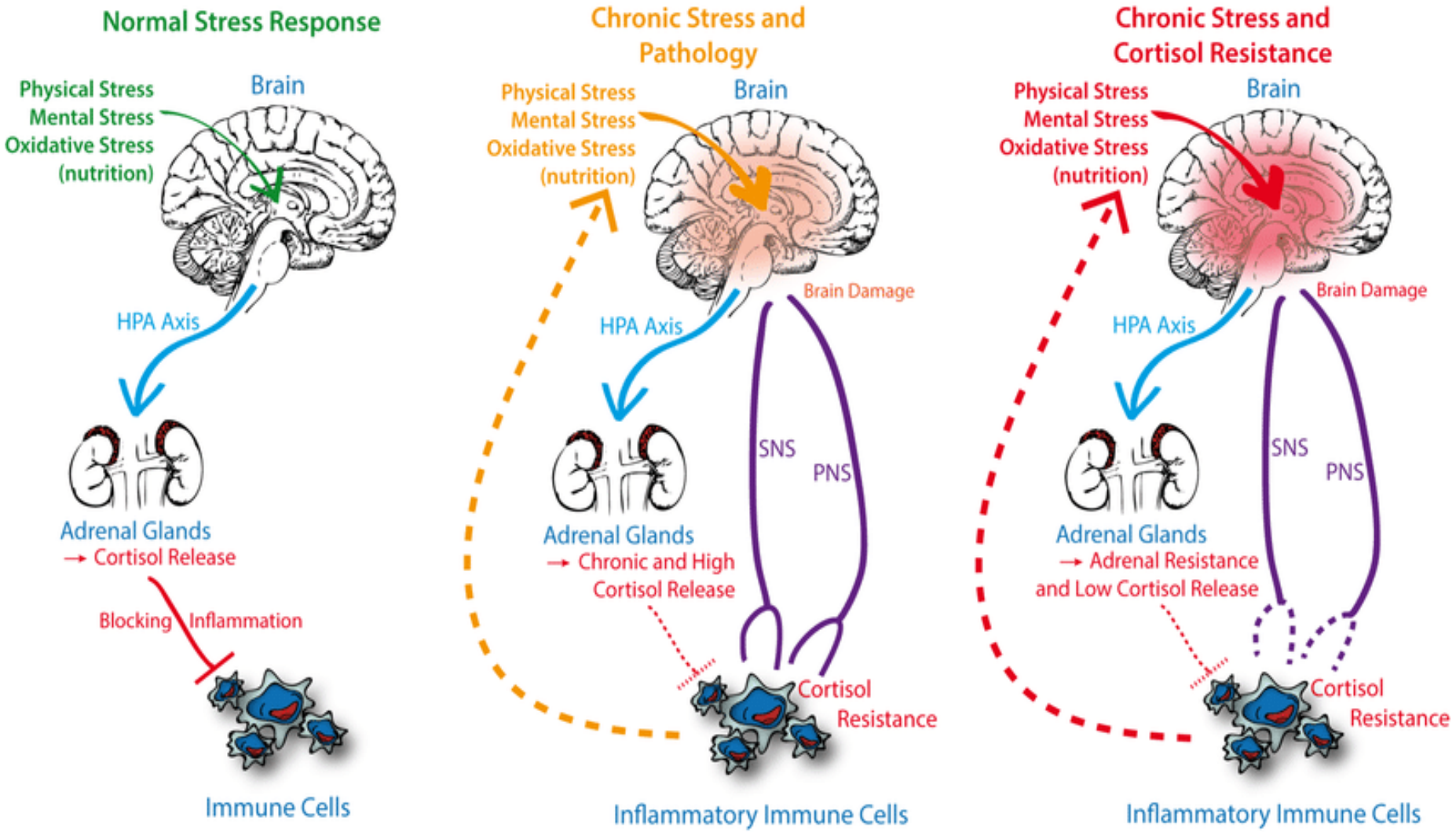
Chronic inflammation and hormone balance



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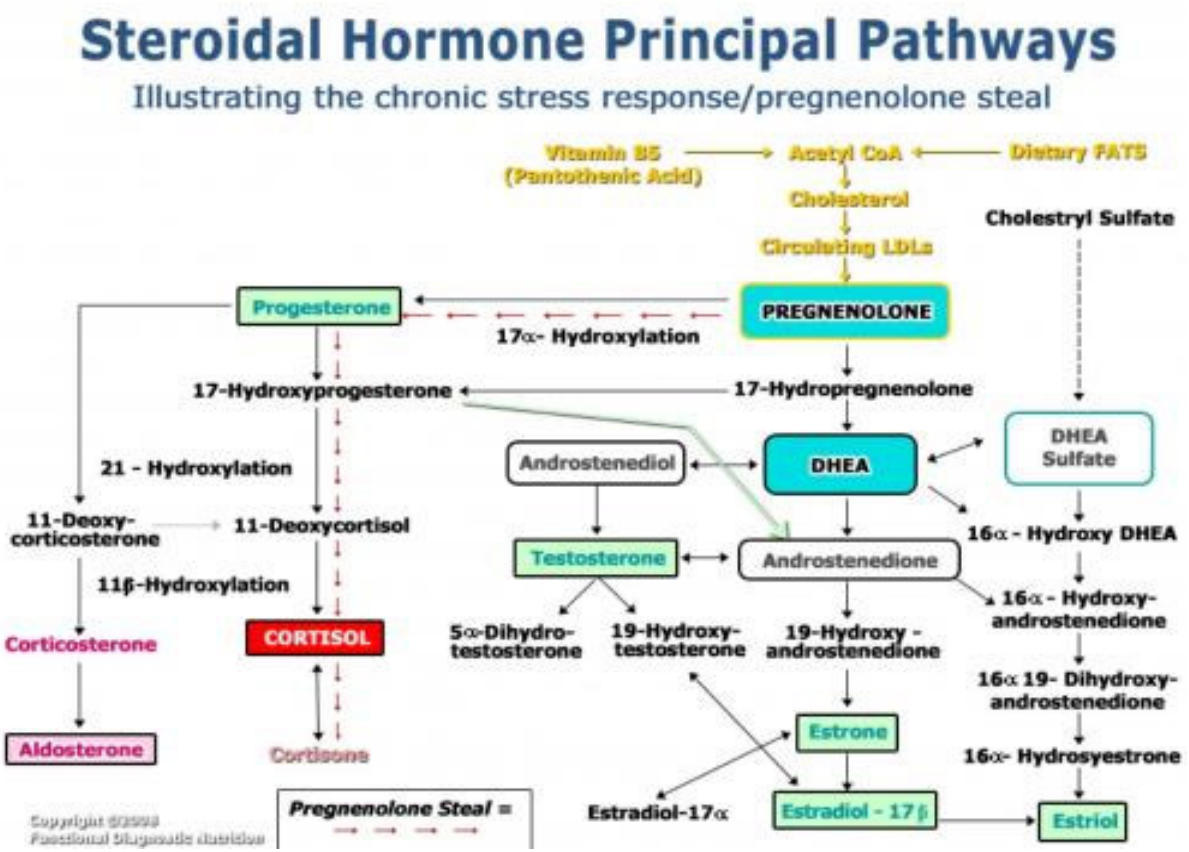
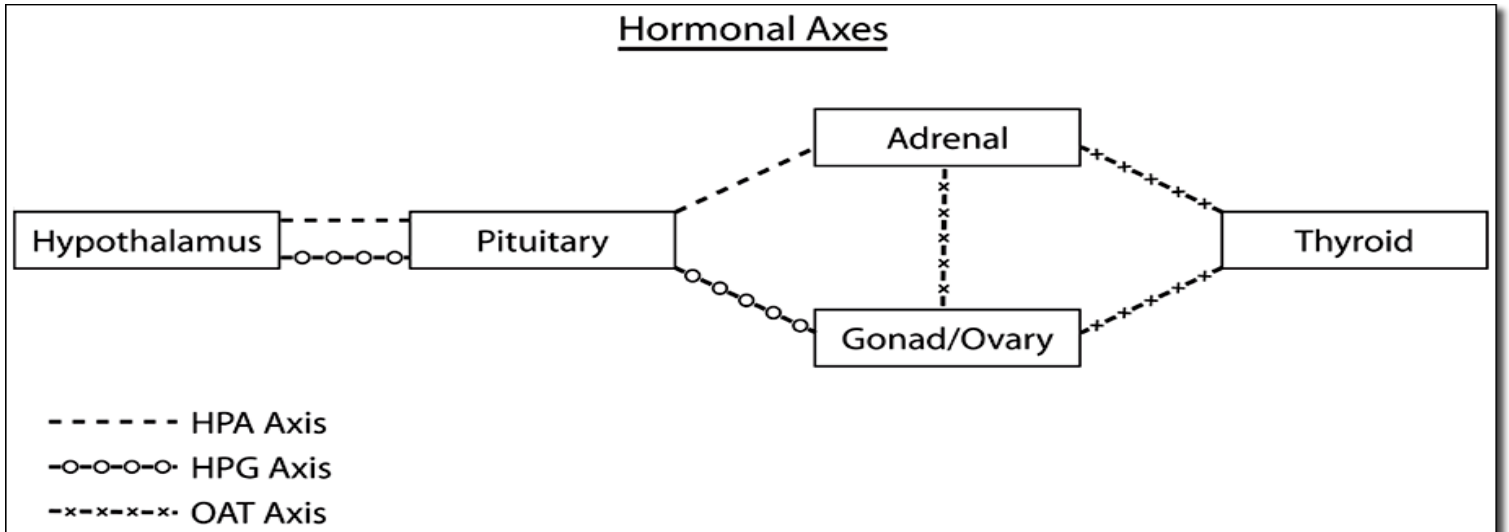


Adrenal support remidies

- Vitamin B5
- Essential fatty acid
- Adaptogen : Cordycep, Ginseng, Licolic ,ashwagandha
- HRT : Hydrocortisone ,Pregnenolone, DHEAs
- Adrenal gland peptide extract



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Journal List › Front Endocrinol (Lausanne) › v.12; 2021 › PMC8030584

frontiers in Endocrinology

Front Endocrinol (Lausanne). 2021; 12: 642755. PMCID: PMC80305
Published online 2021 Mar 22. doi: 10.3389/fendo.2021.642755 PMID: 33841

The Impact of the COVID-19 Pandemic on Women's Reproductive Health

Niamh Phelan, [1,2] Lucy Ann Behan, [1,3] and Lisa Owens [1,2,*]

▸ Author information ▸ Article notes ▸ Copyright and License information Disclaimer

Associated Data

▸ Supplementary Materials

▸ Data Availability Statement

Abstract

Go to: (

Background

The COVID-19 pandemic has profoundly affected the lives of the global population. It is known that periods of stress and psychological distress can affect women's menstrual cycles. We therefore performed an observational study of women's reproductive health over the course of the pandemic thus far.

Materials and Methods

An anonymous digital survey was shared by the authors *via* social media in September 2020. All women of reproductive age were invited to complete the survey.

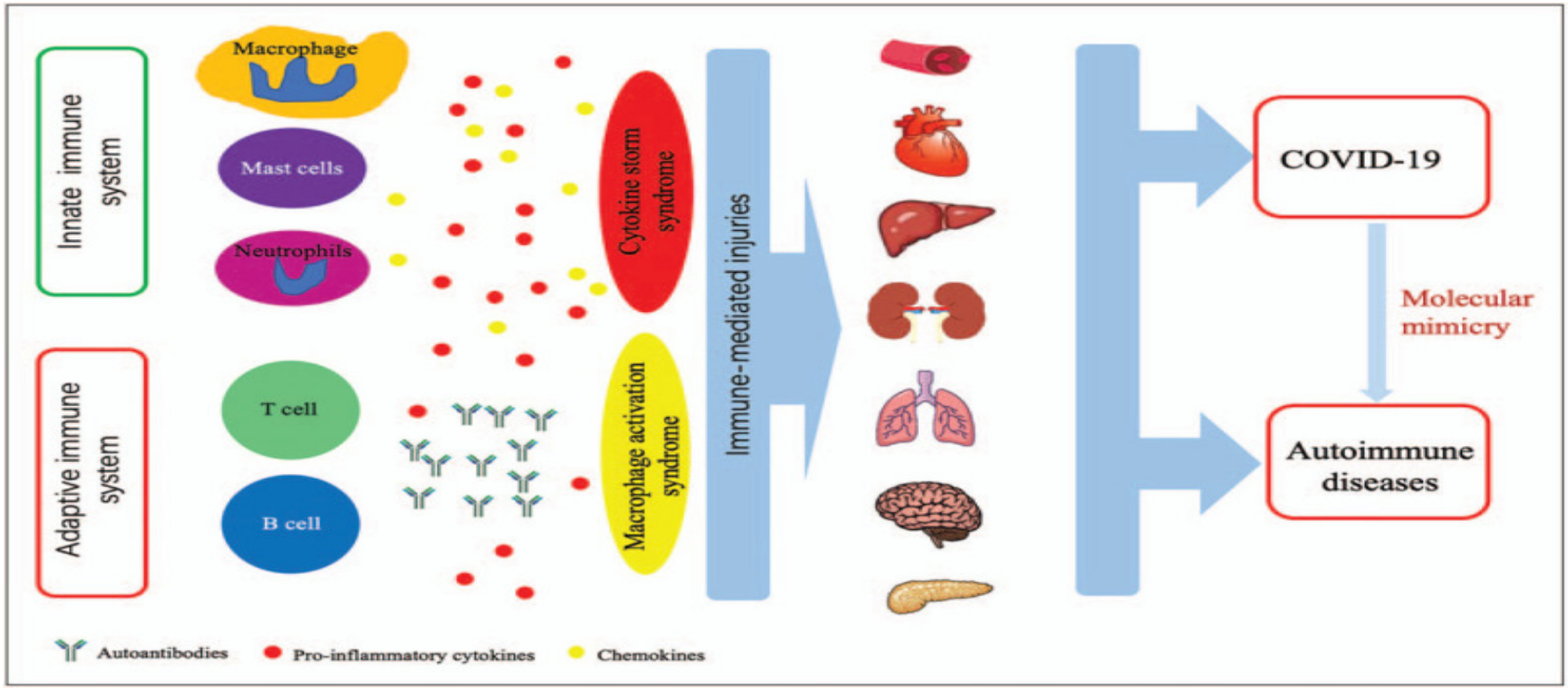
Results

1031 women completed the survey. Mean age was 36.7 ± 6.6 years (range, 15–54). 693/70% reported recording their cycles using an app or diary. 233/23% were using hormonal contraception. 441/46% reported a change in their menstrual cycle since the beginning of the pandemic. 483/53% reported worsening premenstrual symptoms, 100/18% reported new menorrhagia ($p = 0.003$) and 173/30% new dysmenorrhea ($p < 0.0001$) compared to before the pandemic. 72/9% reported missed periods who not previously missed periods ($p = 0.003$) and the median number of missed periods was 2 (1–3). 17/21% of those who "occasionally" missed periods pre-pandemic missed periods "often" during pandemic. 467/45% reported a reduced libido. There was no change in the median cycle length (28 days) or days of bleeding (5) but there was a wider variability of cycle length ($p = 0.01$) and a 1 day median decrease in the minimum ($p < 0.0001$) and maximum ($p = 0.009$) cycle length. Women reported a median 2 kg increase in self-reported weight and a 30-min increase in median weekly exercise. 517/50% of women stated that their diet was worse and 232/23% that it was better than before the pandemic. 407/40% reported working more and 169/16% were working less. Women related a significant increase in low mood ($p < 0.0001$), poor appetite ($p < 0.0001$), binge eating ($p < 0.0001$), poor concentration ($p < 0.0001$), anxiety ($p < 0.0001$), poor sleep ($p < 0.0001$), loneliness ($p < 0.0001$) and excess alcohol use ($p < 0.0001$). Specific stressors reported included work stress (499/48%), difficulty accessing healthcare (254/25%), change in financial (201/19%) situation, difficulties with home schooling (191/19%) or childcare (99/10%), family or partner conflict (170/16%), family illness or bereavement (156/15%).

Conclusions

The COVID-19 pandemic has significantly impacted the reproductive health of women. The long term health implications of this are yet to be determined and future studies should address this.

Autoimmune after COVID infection



- SARS-CoV-2 infection may promote molecular mimicry via human molecular chaperones, mostly heat shock proteins, causing autoimmune polyneuropathic syndromes like Guillain-Barré syndrome.
- Several studies have shown that commonly assayed autoantibodies such as antinuclear antibodies (ANA), anticytoplasmic neutrophil antibodies (ANCA) and antiantiphospholipid (APL) antibodies are **positive in a third to a half of all COVID-19 patients**.

Liu Y, Sawalha AH, Lu Q. COVID-19 and autoimmune diseases. Curr Opin Rheumatol. 2021 Mar 1;33(2):155-162.

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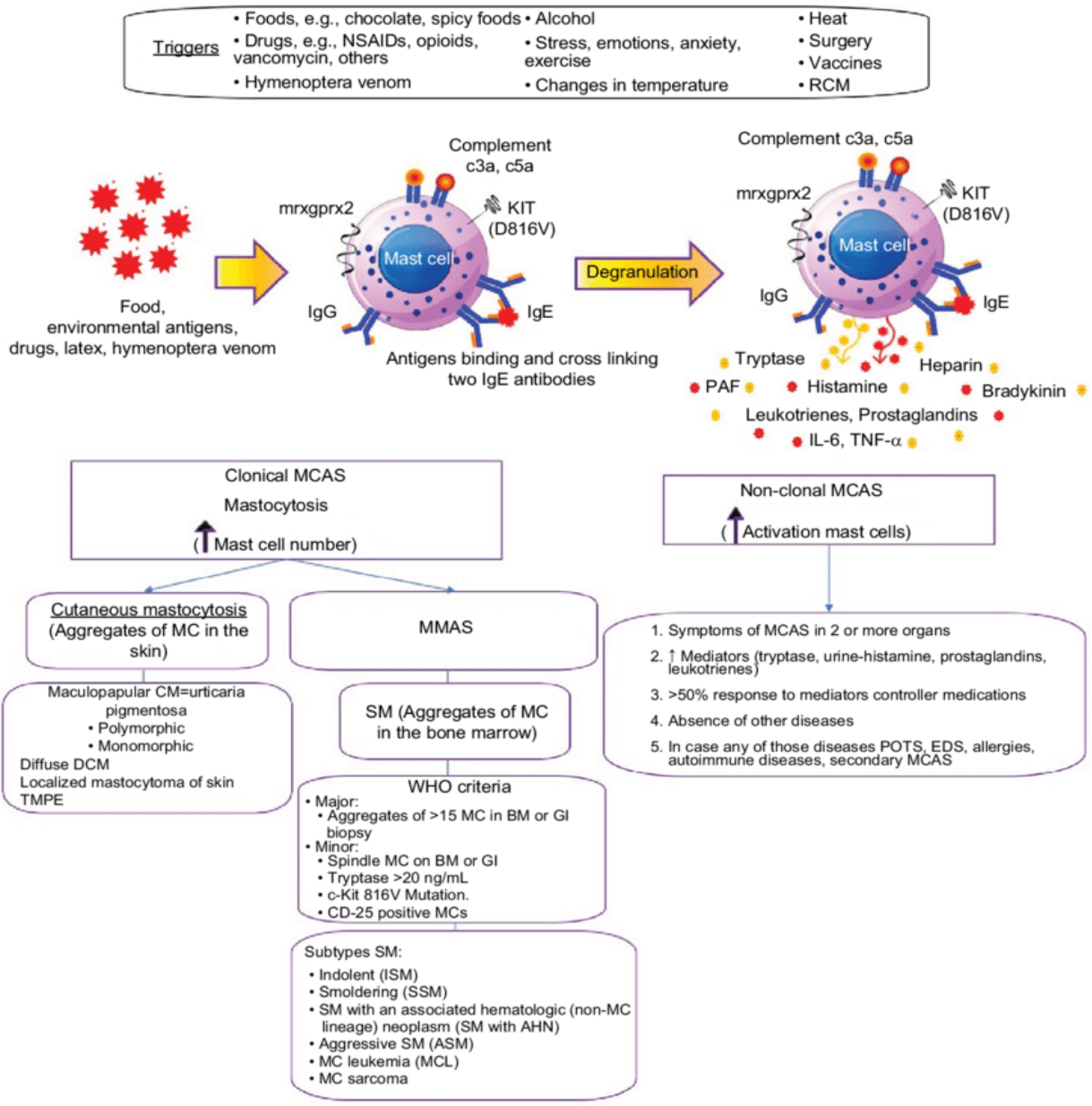
Mast cell activation syndrome



- Mast cell activation is thus likely to increase the intensity of inflammation, delaying recovery and enhancing tissue injury.
- The NHP experiments indicate persistent inflammatory damage even after the infection subsides because of the antibody response.
- Mast cells may be activated in the resolving phase of infection by **autoantibodies** since they have to activate FcγRs on their surface for **antigen- IgG antibody immune complexes**. This may partly account for long COVID-19 but must be established by more research.

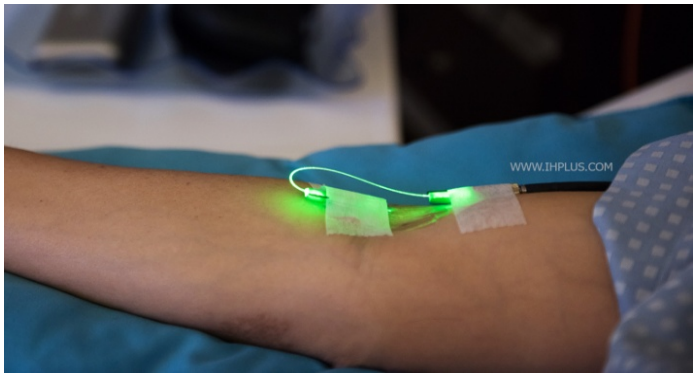
Tan, J. et al. (2021). Signatures of mast cell activation are associated with severe COVID-19. *medRxiv* preprint.

การตรวจวินิจฉัย และการสืบค้นเพิ่มเติม

- วินิจฉัยจากประวัติและอาการ
- การวินิจฉัยแยกโรคอื่นๆ เช่น ภาวะการติดเชื้อแทรกซ้อน หลังหายป่วย
- Invastigetion :

  - Cheast X ray
  - Blood test ;
    - CBC, BUN, Cr, LFT, Electrolyte, Uric acid
    - ESR, Hs CRP, Homocysteine , Ferritin level, FDP D dimer
    - Morning Cortisol , DHEA , Thyroid function test, Vitamin D, Sex hormone profile
    - ANA profile
  - Urine organic acid test

แนวทางการรักษา Long COVID



- Clearance of residual virus and viral shedding
- Optimal nutritional plan
- Inflammatory control
- Treatment fatigue symptom
- Adrenal hormone support
- Promote tissue repair
- Mental health support
- Exercise therapy
- Behavirol and life style management

Sitt,MD.

Clearance of residual virus and viral shedding

- Ivermectin 0.2-0.3 mg/kg OD for 3 days then twice a week
- In 94% of the patients treated with Ivermectin clinical improvement after the 2 doses of Ivermectin.(87.9 % complete improvement)

1. Aroldo, Del & Carvallo, Hector & Roberto, Hirsch. (2021). IVERMECTIN IN LONG-COVID PATIENTS. 10.13140/RG.2.2.14189.51683.
2. Aguirre Chang, Gustavo & Saavedra, Eduardo & Yui, Manuel & Trujillo Figueredo, Aurora & Córdova Masías, José Aníbal. (2020). POST-ACUTE OR PROLONGED COVID-19: IVERMECTIN TREATMENT FOR PATIENTS WITH PERSISTENT SYMPTOMS OR POST-ACUTE. DOI: 10.5281/zenodo.4058613

I-RECOVER

Management Protocol for Long Haul COVID-19 Syndrome (LHCS)

The approach outlined below is a consensus protocol based on a collaboration led by Dr. Mobeen Syed ("Dr. Been"), Dr. Ram Yogendra, Dr. Bruce Patterson, Dr. Tina Peers, and the FLCCC Alliance. Given the lack of clinical treatment trials of Long Haul COVID-19 Syndrome, these recommendations are based on the pathophysiologic mechanisms of COVID-19 and post-viral illnesses along with our collective experience observing profound and sustained clinical responses achieved with the treatment approaches below.

This protocol has also been used to treat **post-vaccine inflammatory syndromes** with similar success. As with all FLCCC Alliance protocols, the components, doses, and durations will evolve as more clinical data accumulates. For the most up-to-date information on optional treatments, go to: flccc.net/flccc-protocols-a-guide-to-the-management-of-covid-19 (see LHCS section).

Initial therapy of Long Haul COVID-19 Syndrome:

IVERMECTIN

0.2–0.4 mg/kg dose – once daily with meals* for 3–5 days (higher doses are sometimes needed in anosmia).

* Take on empty stomach if presenting with nausea/diarrhea/anorexia.

After 3–5 days, change to once or twice weekly depending on the time to symptom recurrence/persistence.

Discontinue after 2–4 weeks if all symptoms have resolved and do not recur.

Relative Contraindications:
- Patients on Warfarin require close monitoring and dose adjustment.
- Pregnant or lactating women require a more in-depth risk/benefit assessment.

If presenting with neurologic symptoms, i.e. poor concentration, forgetfulness, mood disturbance:

FLUVOXAMINE

50 mg – twice daily for 15 days.

Reduce dose or discontinue if side effects develop. Doses as low as 9 mg twice daily have shown efficacy.

Monitor closely as some patients may respond poorly. Some individuals can experience acute anxiety; monitor and treat carefully to prevent rare escalation to suicidal or violent behavior.

If presenting with shortness of breath or low oxygen levels:

PULMONARY EVALUATION

Refer to lung specialist if available, otherwise perform chest imaging (CT preferred) to assess for secondary organizing Pneumonia (OP).

If findings consistent with secondary OP found, initiate **Corticosteroid Therapy** as below. May need to repeat or prolong course of treatment if symptoms or oxygen needs persist.

CT computed tomography scan
OP organizing pneumonia

If not all symptoms resolve with ivermectin:

CORTICOSTEROID THERAPY

A tapering dose of **prednisone** as follows:

1. 0.5 mg/kg daily for 5 days
2. 0.25 mg/kg daily for 5 days
3. 0.12 mg/kg daily for 5 days

Take in morning to lessen impact on sleep.

Side effects may include: increased appetite, mood changes, insomnia, raised blood glucose, dyspepsia.

If symptoms still unresolved or recur after ivermectin and corticosteroid regimens:

TREATMENT OF SUSPECTED MAST CELL ACTIVATION

Choose a Type I and a Type II antihistamine along with a mast cell stabilizer – for example, Loratadine, Famotidine, and Rupatadine. Change medicines if poor response. United States FDA approved doses of many of the below medicines are once daily but can use up to three times daily with caution and close monitoring if poor response or side effects.

First-line Therapy

- Low histamine diet
- *Type I antihistamines:* Loratadine 10 mg, or Cetirizine 10 mg, or Fexofenadine 180 mg – three times daily as tolerated.
- *Type II antihistamines:* Famotidine 20 mg, or Nizatidine 150 mg – twice daily as tolerated.
- *Mast cells stabilizers:*
  - Rupatadine 10 mg – once daily, or Ketotifen 1 mg – once daily at night (increase as tolerated).
  - May add: Sodium Cromoglycate 200 mg – three times daily (increase slowly), or Quercetin 500 mg – three times daily.

Second-line Therapy

- Montelukast 10 mg (beware depression in some) – once daily.
- Low Dose Naltrexone (LDN) – start with 0.5 mg daily, increasing by 0.5 mg weekly up to 4.5 mg daily. Avoid if on opiates.
- Diazepam 0.5–1 mg twice daily.
- SSRIs.

For use in all patients:

MACROPHAGE/MONOCYTE REPOLARIZATION THERAPY

- Vitamin C — 500 mg twice daily
- Omega-3 Fatty Acids — 4 gm/daily (Vascepa, Lovaza, or DHA/EPA)
- Atorvastatin — 40 mg daily
- Melatonin — 2–10 mg nightly, start with low dose, increase as tolerated in absence of sleep disturbance.

Additional Supplement

- Vitamin D3 — 2,000–4,000 IU daily

DHA Docosahexaenoic acid
EPA eicosapentaenoic acid
IU international units
mg/kg dose in mg per kg body weight

Sitt,MD.

nutrients

MDPI

Review

Nutrition in the Actual COVID-19 Pandemic. A Narrative Review

Vicente Javier Clemente-Suárez [1,2,3,*], Domingo Jesús Ramos-Campo [4], Juan Mielgo-Ayuso [5], Athanasios A. Dalamitros [6], Pantelis A. Nikolaidis [7], Alberto Hormeño-Holgado [3] and Jose Francisco Tornero-Aguilera [1,3]

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Abstract: The pandemic of Coronavirus Disease 2019 (COVID-19) has shocked world health authorities generating a global health crisis. The present study discusses the main finding in nutrition sciences associated with COVID-19 in the literature. We conducted a consensus critical review using primary sources, scientific articles, and secondary bibliographic indexes, databases, and web pages. The method was a narrative literature review of the available literature regarding nutrition interventions and nutrition-related factors during the COVID-19 pandemic. The main search engines used in the present research were PubMed, SciELO, and Google Scholar. We found how the COVID-19 lockdown promoted unhealthy dietary changes and increases in body weight of the population, showing obesity and low physical activity levels as increased risk factors of COVID-19 affection and physiopathology. In addition, hospitalized COVID-19 patients presented malnutrition and deficiencies in vitamin C, D, B12 selenium, iron, omega-3, and medium and long-chain fatty acids highlighting the potential health effect of vitamin C and D interventions. Further investigations are needed to show the complete role and implications of nutrition both in the prevention and in the treatment of patients with COVID-19.

Keywords: COVID-19; nutrition; lockdown; body composition; vitamin; dietary pattern; immunology; physical activity; gut

Citation: Clemente-Suárez, V.J.; Ramos-Campo, D.J.; Mielgo-Ayuso, J.; Dalamitros, A.A.; Nikolaidis, P.A.; Hormeño-Holgado, A.; Tornero-Aguilera, J.F. Nutrition in the Actual COVID-19 Pandemic. A Narrative Review. *Nutrients* **2021**, *13*, 1924. https://doi.org/10.3390/nu13061924

Academic Editor: Carlo Agostoni

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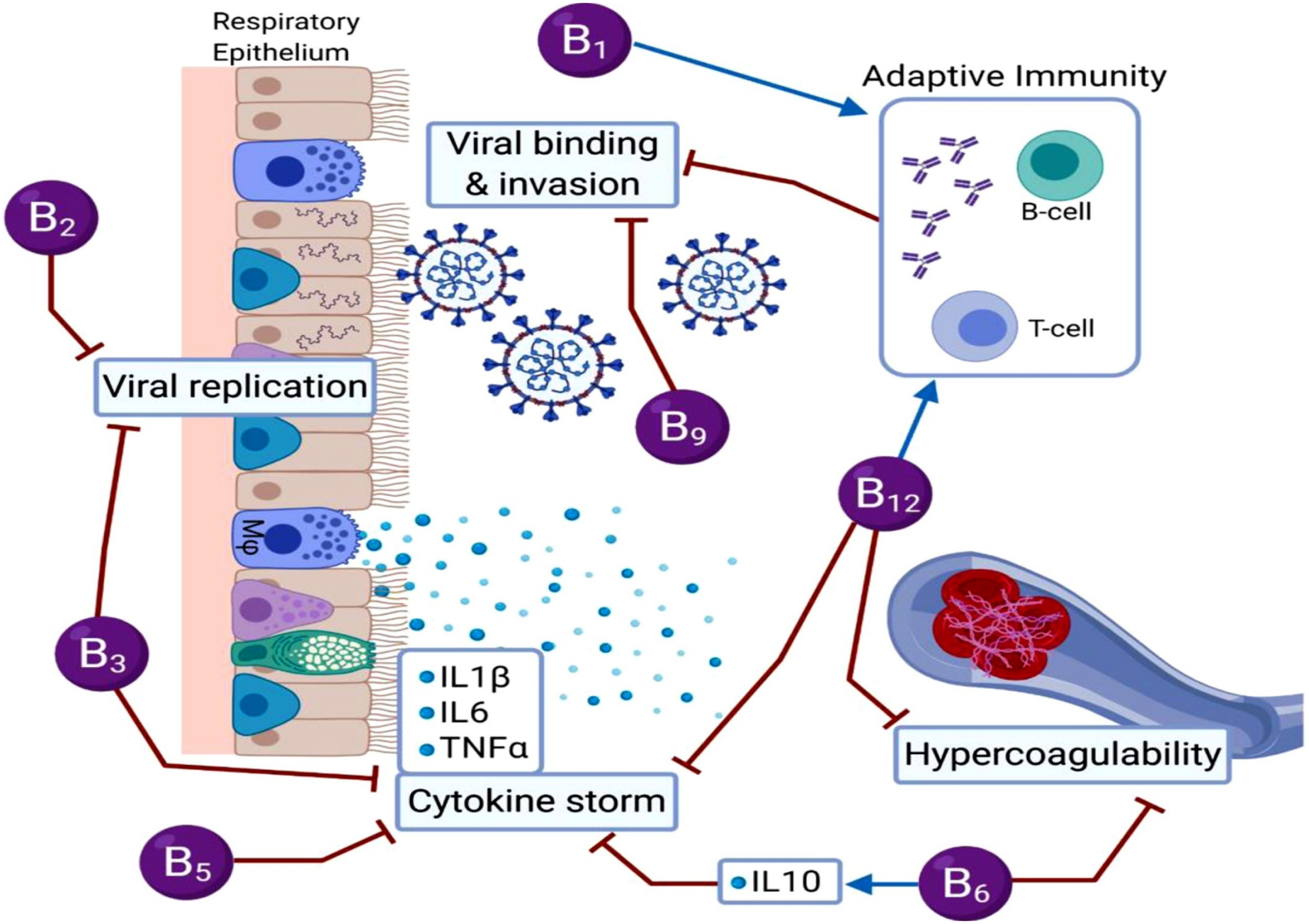
Published: 3 June 2021

Table 1. Nutritional interventions in COVID-19.

Recommendation	Nutritional Intervention	
Avoid	Daily products	
	Snacks	
	Alcohol	
Include	Carbohydrates	<60 % of total caloric value to avoid insulin resistance, hyperglycemia, and acute respiratory distress syndrome. 2 g/kg/day and must not exceed 150 g/day for critically COVID-19 patients.
	Proteins	1.3 g/kg day to reduce muscle loss due to systemic inflammation and improve respiratory muscle strength.
	Fats	1.5 g/kg/day
	Fluids	For stable patients in ICU: 30 mL/kg/day of fluid for adult and 28 mL/kg/day for elderly
Prevent Deficient states	Vitamin C	
	Vitamin D	
	Vitamin B12	
	Selenium	
	Iron	
	ω-3, and medium and long-chain fatty acids	
Keep	Adequate gut microbiome profile	
Physical Activity Intervention		
Avoid	Inactivity	
Keep	Active lifestyle	



Shakoor H, Feehan J, Mikkelsen K, Al Dhaheri AS, Ali HI, Platat C, Ismail LC, Stojanovska L, Apostolopoulos V. Be well: A potential role for vitamin B in COVID-19. Maturitas. 2021 Feb;144:108-111.

HISTAMINE RICH FOODS

TOFU & SOY SAUCE

CHEESE
(especially aged cheese)

MUSHROOM
(meat substitute)

CHOCOLATE

YEAST PRODUCTS

SAUERKRAUT

SMOKED FISH

PROCESSED MEATS

NUTS or SEEDS

FOODS with VINEGAR

SWEETENED BEVERAGES

FERMENTED DRINKS

OVER RIPE FRUITS
(bacteria produce excess histamine)

LEFTOVERS IN THE FRIDGE
(bacteria produce excess histamine)

Beans

Fresh meats

Butter

Low Histamine Foods

Fresh fish

Fruits

Gluten-free grains

Ghee

Vegetables

Original research

Plant-based diets, pescatarian diets and COVID-19 severity: a population-based case–control study in six countries

PDF

PDF + Supplementary Material

XML

Hyunju Kim [1, 2], Casey M Rebholz [1, 2], Sheila Hegde [3], Christine LaFiura [4], Madhunika Raghavan [4], John F Lloyd [5], Susan Cheng [5] and Sara B Seidelmann [6, 7]

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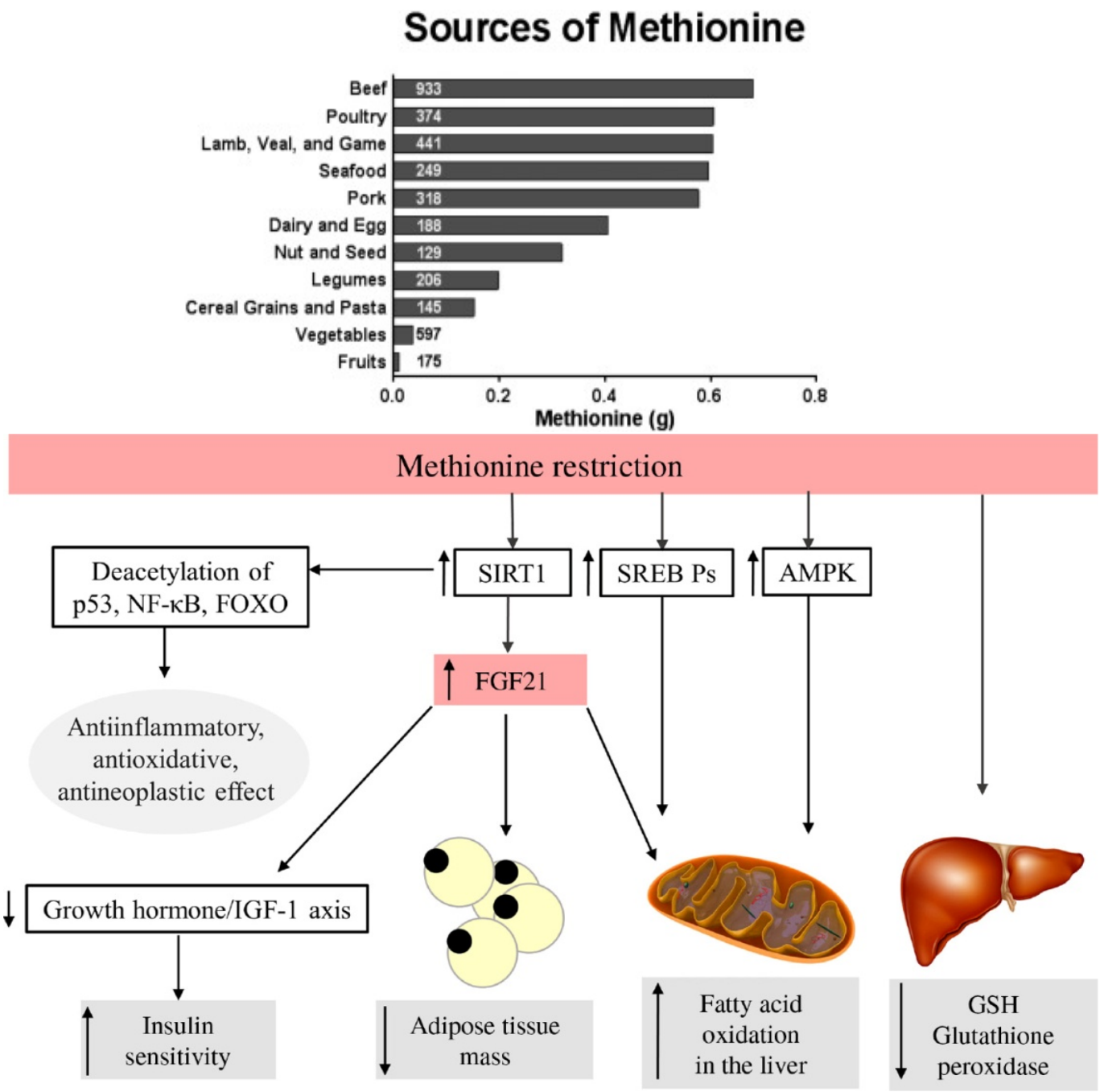
Abstract

Background Several studies have hypothesised that dietary habits may play an important role in COVID-19 infection, severity of symptoms, and duration of illness. However, no previous studies have investigated the association between dietary patterns and COVID-19.

Methods Healthcare workers (HCWs) from six countries (France, Germany, Italy, Spain, UK, USA) with substantial exposure to COVID-19 patients completed a web-based survey from 17 July to 25 September 2020. Participants provided information on demographic characteristics, dietary information, and COVID-19 outcomes. We used multivariable logistic regression models to evaluate the association between self-reported diets and COVID-19 infection, severity, and duration.

Results There were 568 COVID-19 cases and 2316 controls. Among the 568 cases, 138 individuals had moderate-to-severe COVID-19 severity whereas 430 individuals had very mild to mild COVID-19 severity. After adjusting for important confounders, participants who reported following 'plant-based diets' and 'plant-based diets or pescatarian diets' had 73% (OR 0.27, 95% CI 0.10 to 0.81) and 59% (OR 0.41, 95% CI 0.17 to 0.99) lower odds of moderate-to-severe COVID-19 severity, respectively, compared with participants who did not follow these diets. Compared with participants who reported following 'plant-based diets', those who reported following 'low carbohydrate, high protein diets' had greater odds of moderate-to-severe COVID-19 (OR 3.86, 95% CI 1.13 to 13.24). No association was observed between self-reported diets and COVID-19 infection or duration.

Conclusion In six countries, plant-based diets or pescatarian diets were associated with lower odds of moderate-to-severe COVID-19. These dietary patterns may be considered for protection against severe COVID-19.



Ables GP, Johnson JE. Pleiotropic responses to methionine restriction. *Exp Gerontol*. 2017;94:83-88. doi:10.1016/j.exger.2017.01.012

Amino acid therapy

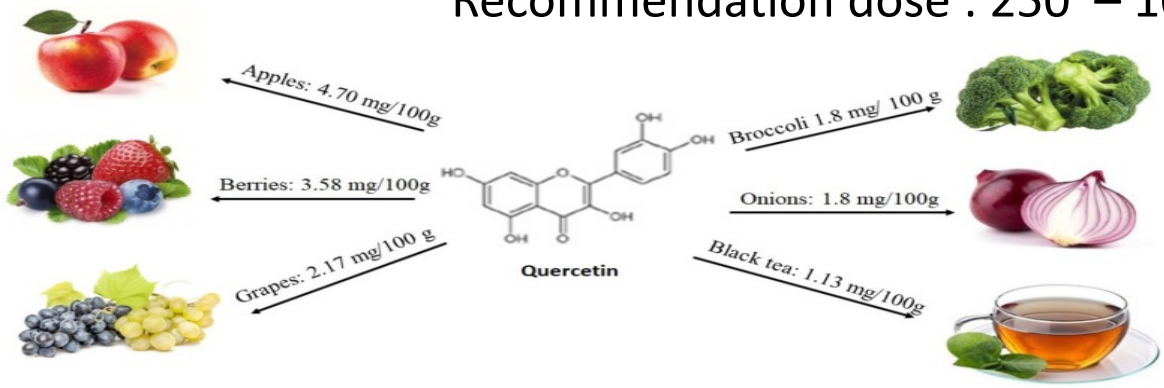
- Tryptophan
- Arginine, Glutamine , Glycine and Cysteine can improve lung damage induce by infection or any inflammation
- Branch chain amino acid : Valine, Leucine and Isoleucine can preserve muscle mass prevent sarcopenia and improve energy production

Ferrara F, De Rosa F, Vitiello A. The Central Role of Clinical Nutrition in COVID-19 Patients During and After Hospitalization in Intensive Care Unit [published online ahead of print, 2020 Jul 15]. *SN Compr Clin Med*. 2020;1-5. doi:10.1007/s42399-020-00410-0

Quercitin

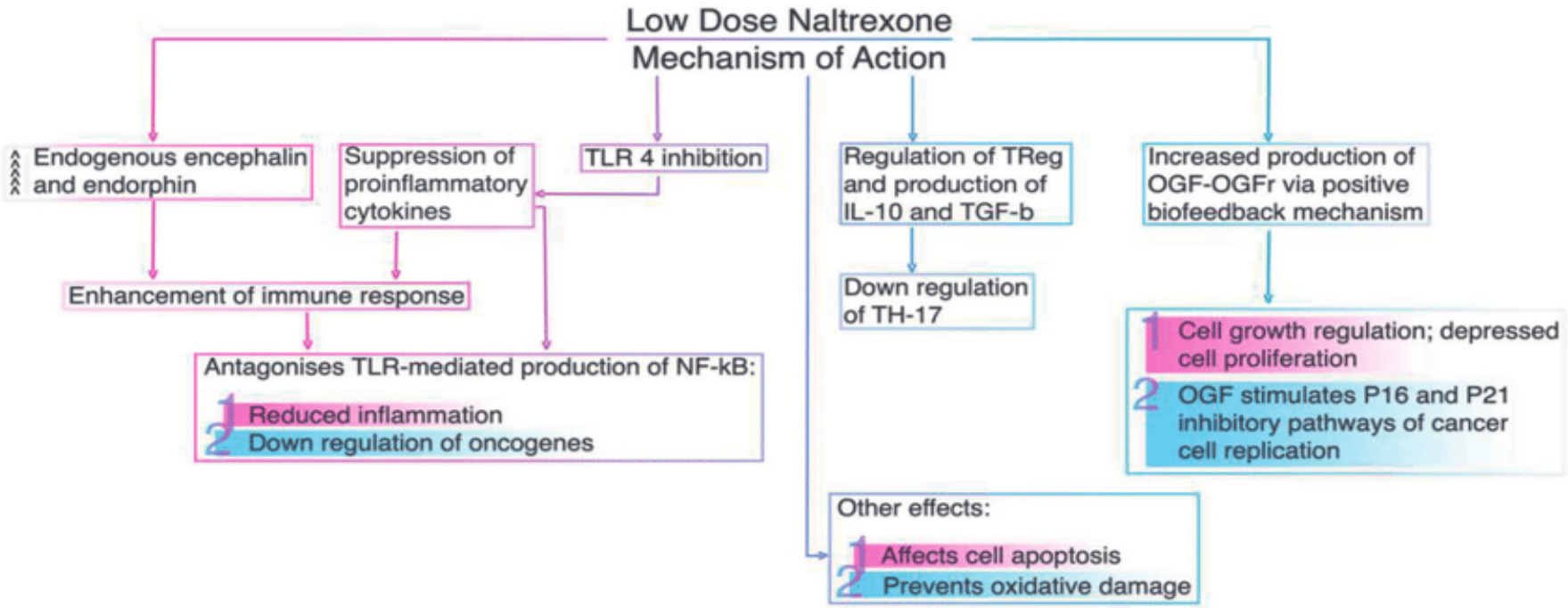
- Quercitin สามารถยับยั้ง COX and LOX enzyme.กระตุ้น TH1 ลด TH2 ควบคุมการหลั่ง IgE และ IL6 ทำหน้าที่เป็น **Natural mast cell stabilizer** และปกป้องการทำงานของภูมิต้านทานในลำไส้ (PMID: 26999194)
- มีคุณสมบัติยับยั้งเซลล์มะเร็ง และยับยั้งไวรัส ช่วยให้ Zn เข้า Cell ได้ดีขึ้น (PMID: 26712783)
- Quercetin สามารถยับยั้ง NLRP3 inflammasome
- Antioxidant
- Potential for anti SRAS Co V2

Recommendation dose : 250 – 1000 mg daily



1. Saeedi-Boroujeni, A., Mahmoudian-Sani, MR. Anti-inflammatory potential of Quercetin in COVID-19 treatment. *J Inflamm* **18,** 3 (2021).
2. Di Pierro F, Iqtadar S, Khan A, Ullah Mumtaz S, Masud Chaudhry M, Bertuccioli A, Derosa G, Maffioli P, Togni S, Riva A, Allegrini P, Khan S. Potential Clinical Benefits of Quercetin in the Early Stage of COVID-19: Results of a Second, Pilot, Randomized, Controlled and Open-Label Clinical Trial. *Int J Gen Med*. 2021;14:2807-2816

Low dose naltrexone



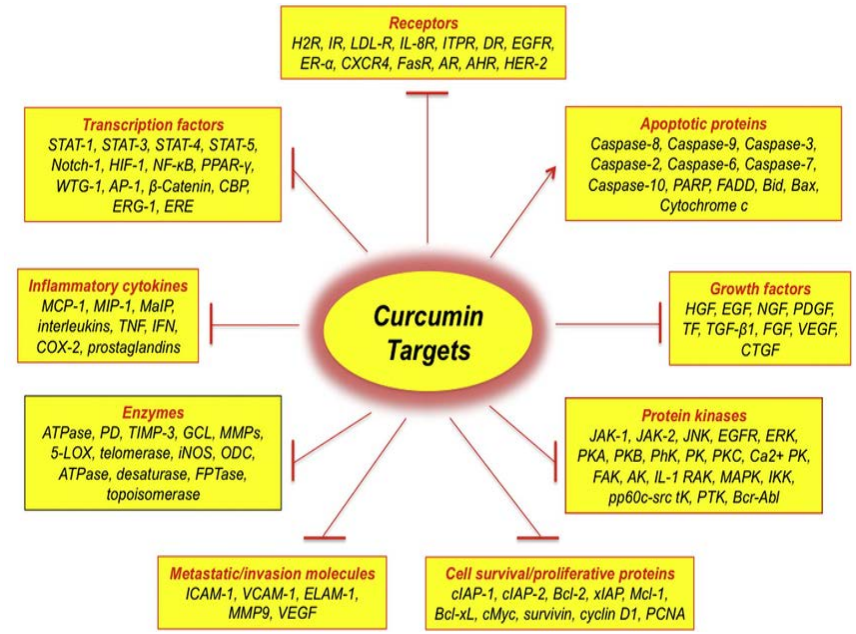
- Naltrexone is classical opioid antagonists.
- In substantially lower than standard doses, they exert different pharmacodynamics.
- Low-dose naltrexone (LDN), considered in a daily dose of 1 to 5 mg, has been shown to reduce glial inflammatory response by modulating Toll-like receptor 4 signaling in addition to systemically upregulating endogenous opioid signaling by transient opioid-receptor blockade.

Low dose naltrexone

Dose Range	Dose Specific Mechanism of Action	Clinical Use
Standard (50–100 mg)	Opioid receptor antagonism	Alcohol and opiate abuse
Low-dose (1–5 mg)	Toll-like receptor 4 antagonism, opioid growth factor antagonism	Fibromyalgia, multiple sclerosis, Crohn's disease, cancer, Hailey-Hailey disease, complex-regional pain syndrome
Very low-dose (0.001–1 mg)	Possibly same as low-dose	Add-on to methadone detoxification taper
Ultra low-dose (<0.001 mg)	Binding to high affinity filamin-A (FLNA) site and reducing μ-opioid receptor associated Gs-coupling	Potentiating opioid analgesia

Toljan K, Vrooman B. Low-Dose Naltrexone (LDN)-Review of Therapeutic Utilization. *Med Sci (Basel)*. 2018;6(4):82. Published 2018 Sep 21.

Curcumin

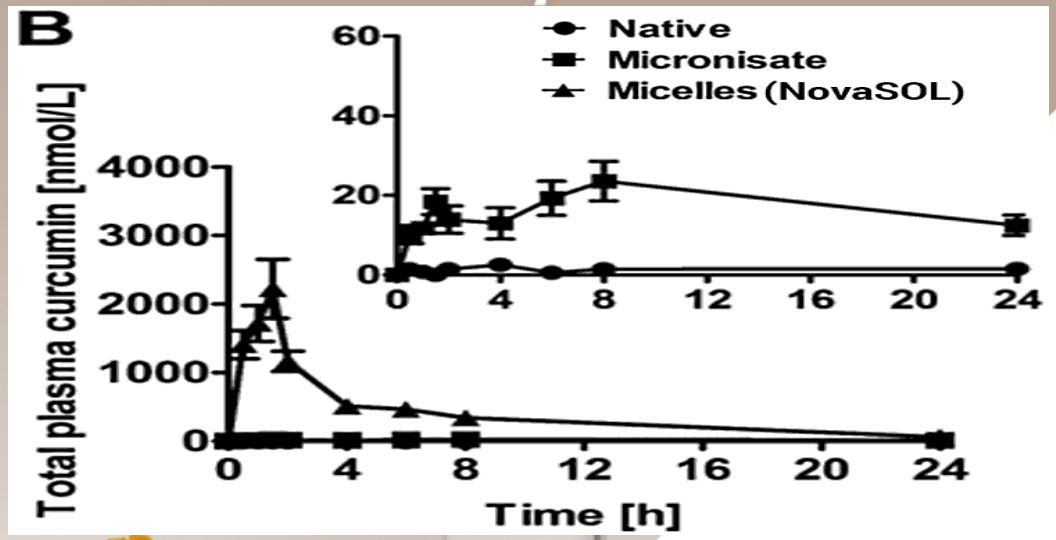


Curcumin : เคอร์คูมิน

- Source : Spice tumeric (Curcuma Longa)
- Curcuminoid : curcumin (diferuloylmethane), demoethoxycurcumin, bisodemethyoxycurcumin
- สารสกัด Curcumin สามารถลดระดับของค่าการอักเสบต่างๆอาทิเช่น CRP ,IL-1B ,IL-2,IL-5,IL-6,IL-8,IL-12,IL-18,IFN-γ,inducible NO synthase,5-LOX,monocyte chemoattractive protein,machrophage inflammatory protein-1$^{\alpha}$
- มีฤทธิ์ต้านเชื้อจุลชีพ Anti-microbial (anti-viral, anti-fungal, & anti-bacterial)
- มีฤทธิ์ต้านมะเร็ง Anti cancer property
- Recommendation dose : 200 – 1000 mg daily

Prasad S, Gupta SC, Tyagi AK, Aggarwal BB. Curcumin, a component of golden spice: from bedside to bench and back. *Biotechnol Adv*. 2014;32(6):1053-1064.

Bioavailability of Curcumin



185 x higher
(12148 nmol/L×h)

9 x higher
(583 nmol/L×h)

1
(66 nmol/L×h)

1) C. Schiborr, et al., The oral bioavailability of curcumin from micronized powder and liquid micelles is significantly increased in healthy humans and differs between sexes, Molecular Nutrition & Food Research 2014, in press.

Doaei et al. J Transl Med (2021) 19:128
https://doi.org/10.1186/s12967-021-02795-5

Journal of Translational Medicine

RESEARCH Open Access

The effect of omega-3 fatty acid supplementation on clinical and biochemical parameters of critically ill patients with COVID-19: a randomized clinical trial

Saeid Doaei[1,2], Somayeh Gholami[3], Samira Rastgoo[4], Maryam Gholamalizadeh[5], Fatemeh Bourbour[4], Seyedeh Elaheh Bagheri[6], Forough Samipoor[3], Mohammad Esmail Akbari[2], Mahdi Shadnoush[7], Fereshteh Ghorat[8], Seyed Alireza Mosavi Jarrahi[2], Narjes Ashouri Mirsadeghi[4], Azadeh Hajipour[9], Parvin Joola[10], Alireza Moslem[11*] and Mark O. Goodarzi[12]

Abstract

Background: Omega-3 polyunsaturated fatty acids (n3-PUFAs) may exert beneficial effects on the immune system of patients with viral infections. This paper aimed to examine the effect of n3-PUFA supplementation on inflammatory and biochemical markers in critically ill patients with COVID-19.

Methods: A double-blind, randomized clinical trial study was conducted on 128 critically ill patients infected with COVID-19 who were randomly assigned to the intervention (fortified formula with n3-PUFA) (n = 42) and control (n = 86) groups. Data on 1 month survival rate, blood glucose, sodium (Na), potassium (K), blood urea nitrogen (BUN), creatinine (Cr), albumin, hematocrit (HCT), calcium (Ca), phosphorus (P), mean arterial pressure (MAP), O_2 saturation (O_2sat), arterial pH, partial pressure of oxygen (PO_2), partial pressure of carbon dioxide (PCO_2), bicarbonate (HCO_3), base excess (Be), white blood cells (WBCs), Glasgow Coma Scale (GCS), hemoglobin (Hb), platelet (Plt), and the partial thromboplastin time (PTT) were collected at baseline and after 14 days of the intervention.

Results: The intervention group had significantly higher 1-month survival rate and higher levels of arterial pH, HCO_3, and Be and lower levels of BUN, Cr, and K compared with the control group after intervention (all $P < 0.05$). There were no significant differences between blood glucose, Na, HCT, Ca, P, MAP, O2sat, PO_2, PCO_2, WBCs, GCS, Hb, Plt, PTT, and albumin between two groups.

Conclusion: Omega-3 supplementation improved the levels of several parameters of respiratory and renal function in critically ill patients with COVID-19. Further clinical studies are warranted.

Trial registry

Name of the registry: This study was registered in the Iranian Registry of Clinical Trials (IRCT); Trial registration number: IRCT20151226025699N3; Date of registration: 2020.5.20; URL of trial registry record: https://en.irct.ir/trial/48213

Keywords: Omega-3 fatty acids, Coronavirus, Kidney function, Respiratory function

SMOF
Intravenous Lipid emulsion infusion

Abstract

Soybean oil–based intravenous fat emulsions have long been used as the primary product for delivery of lipid-based calories in parenteral nutrition formulations in the United States. Proinflammatory properties of these products may be related with poor clinical outcomes and have led investigators to develop newer generations of intravenous fat emulsions. **These alternative formulations are derivatives of medium-chain triglycerides, olive oil, and fish oil in hopes to reduce the inflammatory response and potentially produce a clinically beneficial anti-inflammatory response**. Although surrogate markers support this reduction in inflammatory response, clinical data and outcomes are still limited but potentially promising in the literature. This product review provides a general overview of the alternative-generation intravenous fat emulsion products and the literature supporting the potential transition to such products.

Nutrition in Clinical practice journal Volume: 31 issue: 5, page(s): 610-618 Article first published online: August 15, 2016; Issue published: October 1, 2016 https://doi.org/10.1177/0884533616661174

Intravenous vitamin c infusion

- Intravenous vitamin C 10-25 gm
- The antioxidant, anti-inflammatory, endothelial-restoring, and immunomodulatory effects of high-dose IV vitamin C might be a suitable treatment option.
- Nine clinical studies with 720 participants were identified. Three of the four controlled trials observed a significant decrease in fatigue scores in the vitamin C group compared to the control group.
- Four of the five observational or before-and-after studies observed a significant reduction in pre-post levels of fatigue.

1. Vollbracht C, Kraft K. Feasibility of Vitamin C in the Treatment of Post Viral Fatigue with Focus on Long COVID, Based on a Systematic Review of IV Vitamin C on Fatigue. Nutrients. 2021 Mar 31;13(4):1154.
2. Bilg, R. (2017). A Rapid Evidence Assessment on the Effectiveness of Intravenous Mega-Dose Multivitamins on Fibromyalgia, Chronic Fatigue, Cancer, and Asthma [G].

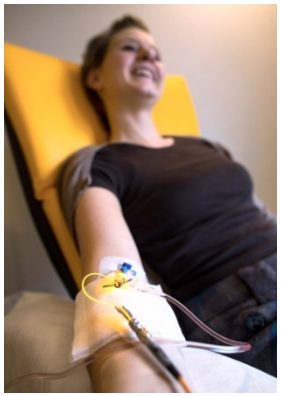
Myers Cocktail

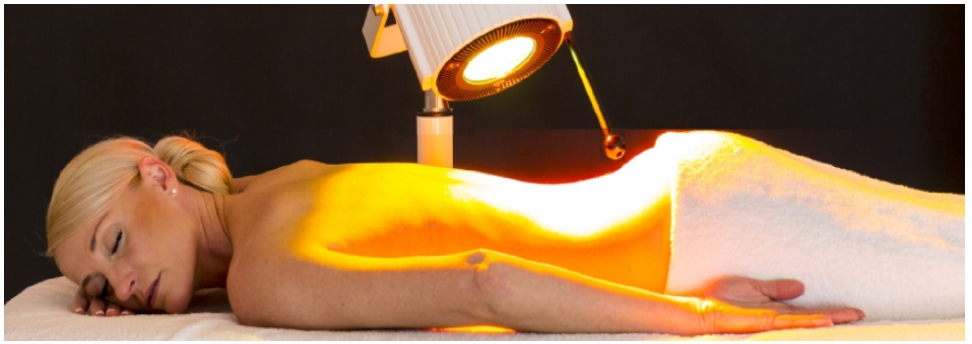
An Intro Venous Vitamin Infusion which will enhance your Immune System,

Release Fatigue, help with Allergies,
reduce symptoms of Fibromyalgia and Asthma.

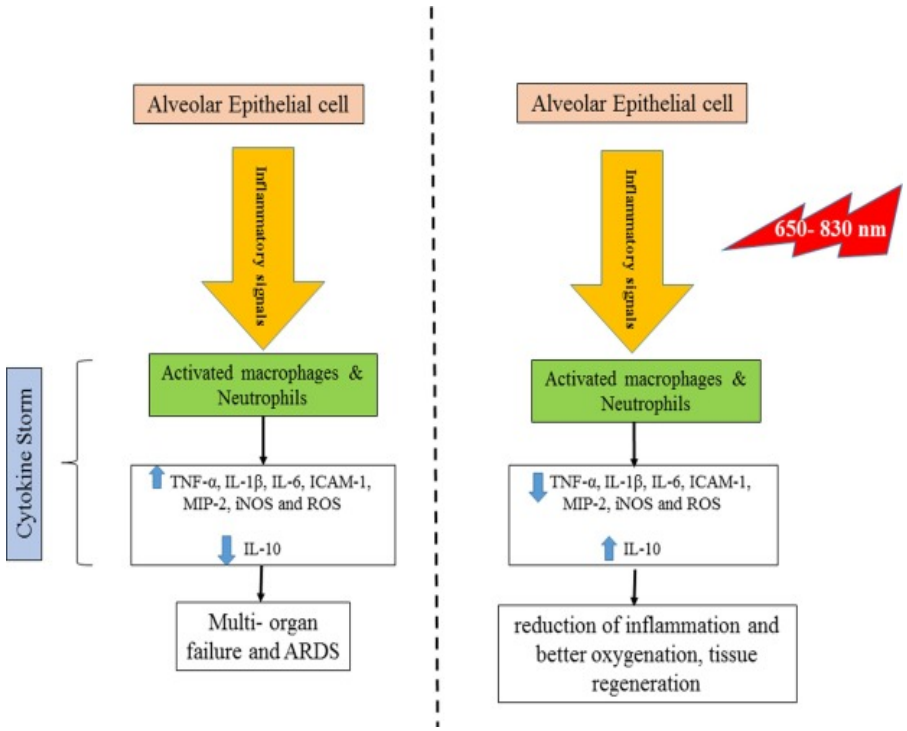
- Chronic fatigue syndrome
- Fibromyalgia
- Asthma or Allergic disease
- Anti aging condition
- Poor immune function
- Boost up energy and increase brain stamina
- Jet lag
- Poor nutritional condition in illness or chronic disease

Low level laser therapy – Photobiomodulation therapy





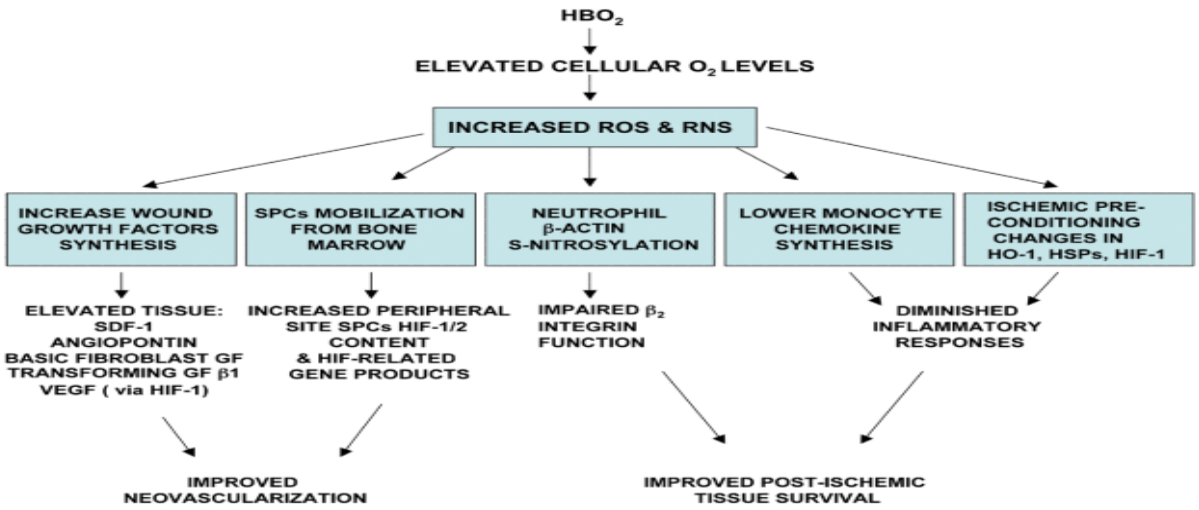
Low level laser therapy – Photobiomodulation therapy



- Photobiomodulation (PBM) can reduce lung edema, cytokines in bronchoalveolar parenchyma, neutrophil influx.
- PBM reduces TNF-α, IL-1β, IL-6, ICAM-1, MIP-2 and Reactive oxygen species.
- Transthoracic approach is the direct methods for reducing lung inflammation.
- Intravenous approach increases the oxygenation of red blood cells.
- Improve clinical fatigue and fibromyalgia

1. Nejatifard M, Asefi S, Jamali R, Hamblin MR, Fekrazad R. Probable positive effects of the photobiomodulation as an adjunctive treatment in COVID-19: A systematic review. Cytokine. 2021 Jan;137:155312.
2. Yeh SW, Hong CH, Shih MC, Tam KW, Huang YH, Kuan YC. Low-Level Laser Therapy for Fibromyalgia: A Systematic Review and Meta-Analysis. Pain Physician. 2019 May;22(3):241-254.

Hyperbaric oxygen therapy



- HBOT seems to be a safe and effective oxygenation method in patients with COVID-19.
- HBOT delivers oxygen in extreme conditions of hypoxemia and tissue hypoxia, even in the presence of lung pathology.
- It provides anti-inflammatory and anti-proinflammatory effects likely to ameliorate the overexuberant immune response common to COVID-19.
- Hyperbaric Oxygen Therapy has been studied and used in patients with CFS and shown to alleviate symptoms a great deal. HBOT shoulc ameliorate symptoms and even shorten the convalescence phase of post viral syndrome of COVID-19.

1. Feldmeier JJ, Kirby JP, Buckey JC, Denham DW, Evangelista JS, Gelly HB, Harlan NP, Mirza ZK, Ray KL, Robins M, Savaser DJ, Wainwright S, Bird N, Huang ET, Moon RE, Thom SR, Weaver LK. Physiologic and biochemical rationale for treating COVID-19 patients with hyperbaric oxygen. Undersea Hyperb Med. 2021 First-Quarter;48(1):1-12.
2. Oliaei, S., SeyedAlinaghi, S., Mehrtak, M. *et al.* The effects of hyperbaric oxygen therapy (HBOT) on coronavirus disease-2019 (COVID-19): a systematic review. *Eur J Med Res* **26,** 96 (2021).

Vol.3, No.7, 432-436 (2011)
doi:10.4236/health.2011.37071

The effect of mild-pressure hyperbaric therapy (Oasis O_2) on fatigue and oxidative stress

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ABSTRACT

Mild-pressure hyperbaric therapy (mHBT) has become increasingly popular among elite athletes and most recently among the general public yet there is very little scientific underpinnings on its therapeutic use. In this study, fifteen healthy volunteers (8 men, 7 women, mean age 29.7 ± 8.1 years) were exposed to 1.3 atmospheres absolute (ATA) for 40 minutes in a mild hyperbaric chamber called "Oasis O_2" to determine the effect of ambient air at 1.3 ATA on oxidative stress, antioxidant potential, fatigue, and blood chemistry. Reactive oxygen metabolites (ROMs), an index of oxidative stress, significantly reduced by 11% ($p = 0.006$), while biological antioxidant potential (BAP), an index of antioxidant capacity, did not show a significant change ($p = 0.749$). WBC count significantly reduced by 10.4% ($p = 0.005$) whereas WBC differential did not show a marked change. The mean visual analog scale (VAS) score for fatigue significantly decreased from 5.0 to 2.1 ($p < 0.001$). Our findings suggest that mild-pressure hyperbaric therapy reduces oxidative stress as indicated by a significant decrease in serum ROM, and also helps improve fatigue as seen by a significant decrease in VAS fatigue scores.

Keywords: Mild-Pressure Hyperbaric Chambe; Oxidative Stress; Free Radicals; Reactive Oxygen Species (ROS)

1. INTRODUCTION

Mild-pressure hyperbaric therapy (mHBT) has become increasingly popular among elite athletes and most recently among the general public as a modality to improve fatigue, enhance overall health and well-being, heal sports-related injuries, and promote anti-aging. The hyperbaric chambers used for these purposes are soft-sided chambers made of elastic fiber such as the "Oasis O_2" used in this study. Many manufacturers distribute similar chambers for widespread use and they are collectively referred to as "mild-pressure hyperbaric chambers". These are frequently mistaken for hospital grade hyperbaric oxygen therapy (HBO) chambers despite the vastly different specifications between HBO and mHBT. The "Oasis O_2" uses 1.3 atmospheres absolute (ATA) ambient air whereas HBO is the intermittent administration of 100% oxygen at therapeutic pressures of 2-3 ATA with more than 60 minutes of depressurization time.

HBO is claimed to "revitalize" hypoxic tissues, supplement oxygen to under-oxygenated tissues, reduce edema, promote fibroblast proliferation for tissue regeneration, mobilize white blood cells (WBCs), and improve resistance and immunity against infection and inflammation [1]. HBO has been traditionally indicated for decompression sickness and acute carbon monoxide poisoning; its clinical applications have since expanded to include the treatment of other conditions such as external injuries and central nervous system disorders because of its tissue regenerative capacity [2]. The value of oxygen therapy has long been known and HBO is a modern form of this treatment that provides enriched oxygen under high pressure to promote tissue regeneration. However, the delivery of high-density, pressurized oxygen has also been found to create problems by generating free radicals. Oxygen toxicity is a side effect of HBO that results from breathing high partial pressures of oxygen accompanied by an uncontrolled increase in reactive oxygen species (ROS) [3]. Normally the living organism has an "antioxidant system" that controls the development of ROS, but when this system's scavenging capacity is overcome by the enhanced formation of ROS,

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REVIEW ARTICLE OPEN

Check for updates

Updates on clinical trials evaluating the regenerative potential of allogenic mesenchymal stem cells in COVID-19

Dhavan Sharma[1] and Feng Zhao[1]✉

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has infected nearly 118 million people and caused ~2.6 million deaths worldwide by early 2021, during the coronavirus disease 2019 (COVID-19) pandemic. Although the majority of infected patients show mild-to-moderate symptoms, a small fraction of patients develops severe symptoms. Uncontrolled cytokine production and the lack of substantive adaptive immune response result in hypoxia, acute respiratory distress syndrome (ARDS), or multiple organ failure in severe COVID-19 patients. Since the current standard of care treatment is insufficient to alleviate severe COVID-19 symptoms, many clinics have been prompted to perform clinical trials involving the infusion of mesenchymal stem cells (MSCs) due to their immunomodulatory and therapeutic properties. Several phases I/II clinical trials involving the infusion of allogenic MSCs have been performed last year. The focus of this review is to critically evaluate the safety and efficacy outcomes of the most recent, placebo-controlled phase I/II clinical studies that enrolled a larger number of patients, in order to provide a statistically relevant and comprehensive understanding of MSC's therapeutic potential in severe COVID-19 patients. Clinical outcomes obtained from these studies clearly indicate that: (i) allogenic MSC infusion in COVID-19 patients with ARDS is safe and effective enough to decreases a set of inflammatory cytokines that may drive COVID-19 associated cytokine storm, and (ii) MSC infusion efficiently improves COVID-19 patient survival and reduces recovery time. These findings strongly support further investigation into MSC-infusion in larger clinical trials for COVID-19 patients with ARDS, who currently have a nearly 50% of mortality rate.

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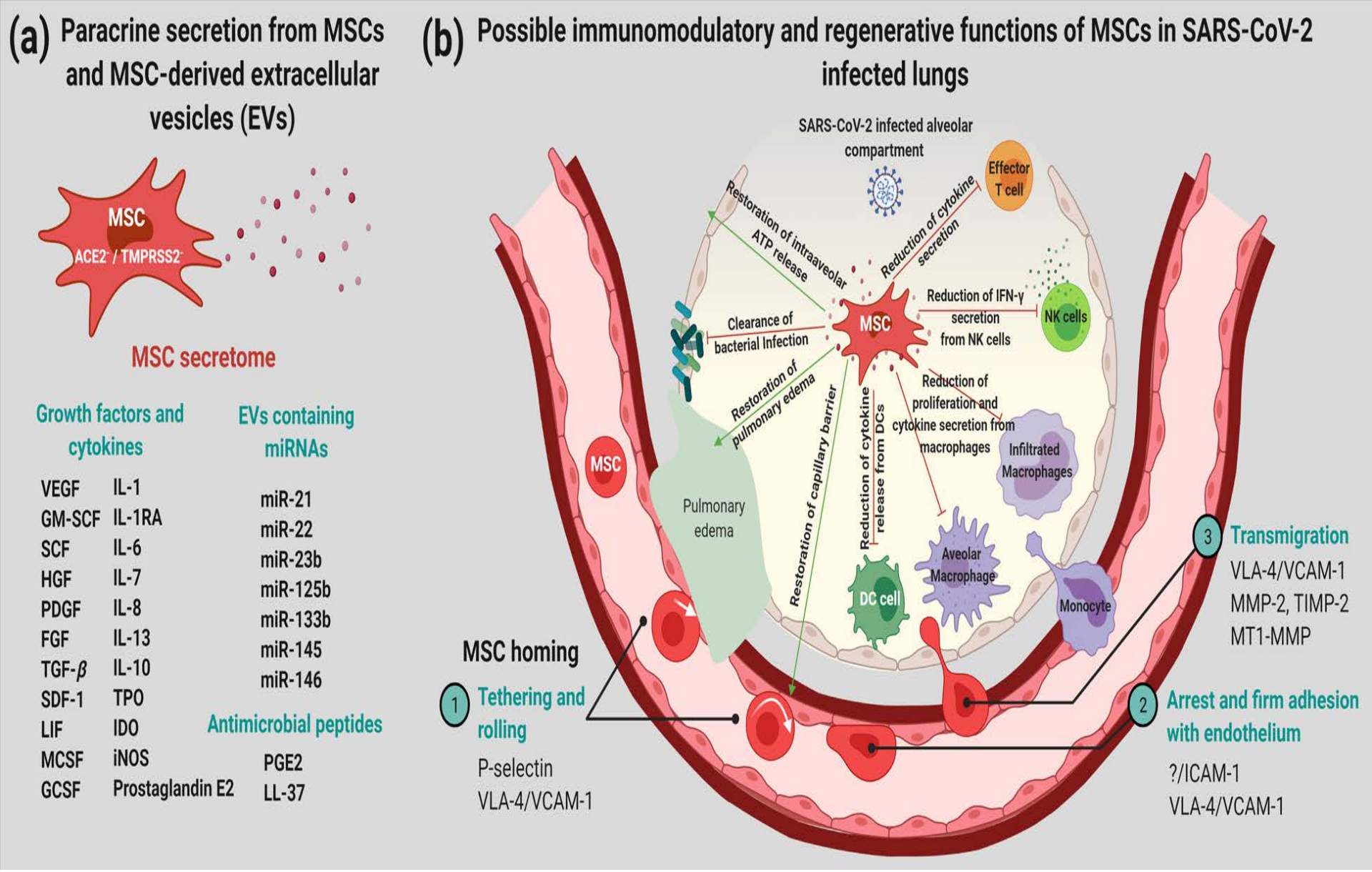

(a) Paracrine factors secreted by MSCs and MSC-derived Evs

(**b**) Mechanism of MSC homing and possible immunomodulatory and regenerative functions of MSCs in the alveolar compartment of COVID-19 patients.

Sharma, D., Zhao, F. Updates on clinical trials evaluating the regenerative potential of allogenic mesenchymal stem cells in COVID-19. *npj Regen Med* **6,** 37 (2021).

cells

MDPI

Perspective

Mesenchymal Stromal Cell Secretome for Post-COVID-19 Pulmonary Fibrosis: A New Therapy to Treat the Long-Term Lung Sequelae?

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Abstract: To date, more than 100 million people worldwide have recovered from COVID-19. Unfortunately, although the virus is eradicated in such patients, fibrotic irreversible interstitial lung disease (pulmonary fibrosis, PF) is clinically evident. Given the vast numbers of individuals affected, it is urgent to design a strategy to prevent a second wave of late mortality associated with COVID-19 PF as a long-term consequence of such a devastating pandemic. Available antifibrotic therapies, namely nintedanib and pirfenidone, might have a role in attenuating profibrotic pathways in SARS-CoV-2 infection but are not economically sustainable by national health systems and have critical adverse effects. It is our opinion that the mesenchymal stem cell secretome could offer a new therapeutic approach in treating COVID-19 fibrotic lungs through its anti-inflammatory and antifibrotic factors.

Keywords: SARS-CoV-2; COVID-19; pulmonary fibrosis; mesenchymal stem cells; extracellular vesicles; microvesicles; exosomes; secretome

Citation: Bari, E.; Ferrarotti, I.; Saracino, L.; Perteghella, S.; Torre, M.L.; Richeldi, L.; Corsico, A.G. Mesenchymal Stromal Cell Secretome for Post-COVID-19 Pulmonary Fibrosis: A New Therapy to Treat the Long-Term Lung Sequelae?. *Cells* **2021**, *10*, 1203. https://doi.org/10.3390/cells10051203

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The novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has caused more than 117 million global cases and 2.6 million global deaths in the first year of the pandemic [1], with enormous economic and social derangements. In this unprecedented pandemic, serious efforts are being made worldwide. Regarding the preventive approach, good hygiene, social distancing and quarantine practices are applied to reduce the virus's transmission. Advanced molecular biology and biotechnological approaches have been exploited to develop and launch effective vaccines against SARS-CoV-2 [2]. About the curative approach, an array of drugs are being studied for COVID-19 treatment in hundreds of clinical trials worldwide, as recently reviewed [3]. Therefore, although the COVID-19 pandemic still represents a challenge, instruments are available to prevent and treat the acute phase's infection. However, very little has been done to solve the long-term consequence of such a devastating pandemic.

To date, more than 100 million people worldwide have recovered from COVID-19. Unfortunately, although the virus is eradicated in such patients, fibrotic interstitial lung disease (pulmonary fibrosis, PF) may become clinically evident in a large percentage of patients.

Generally speaking, PF can develop either following chronic inflammation or as a

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Review article

Therapeutic potential of mesenchymal stem cells in multiple organs affected by COVID-19

Gustavo C. Paris, Aline A. Azevedo, Adriana L. Ferreira, Yanca M.A. Azevedo, Mateus A. Rainho, Genilza P. Oliveira, Karina R. Silva, Erika A.C. Cortez, Ana C. Stumbo, Simone N. Carvalho, Lais de Carvalho, Alessandra A. Thole *

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ABSTRACT

Currently, the world has been devastated by an unprecedented pandemic in this century. The Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), the agent of coronavirus disease 2019 (COVID-19), has been causing disorders, dysfunction and morphophysiological alterations in multiple organs as the disease evolves. There is a great scientific community effort to obtain a therapy capable of reaching the multiple affected organs in order to contribute for tissue repair and regeneration. In this regard, mesenchymal stem cells (MSCs) have emerged as potential candidates concerning the promotion of beneficial actions at different stages of COVID-19. MSCs are promising due to the observed therapeutic effects in respiratory preclinical models, as well as in cardiac, vascular, renal and nervous system models. Their immunomodulatory properties and secretion of paracrine mediators, such as cytokines, chemokines, growth factors and extracellular vesicles allow for long range tissue modulation and, particularly, blood-brain barrier crossing. This review focuses on SARS-CoV-2 impact to lungs, kidneys, heart, vasculature and central nervous system while discussing promising MSC's therapeutic mechanisms in each tissue. In addition, MSC's therapeutic effects in high-risk groups for COVID-19, such as obese, diabetic and hypertensive patients are also explored.

Table 1
COVID-19 multi organ pathology and MSC's potential therapeutic mechanisms.

Organs	SARS-CoV-2 pathogenesis	MSC therapeutic potential
Lungs	Cytokine storm	Immunomodulation → paracrine signaling (PGE2, TSG-6, HVEM-BTLA)
	Diffuse alveolar injury	↓ viral load - LL37 protein
	Hyaline membrane formation	↓ epithelial cells apoptosis
	Exudate and cell infiltration inside alveoli	↑ alveolar fluid clearance and angiogenesis
	Possible secondary infection	↓ histological injury
	Progressive loss of function	↓ pulmonary fibrosis (TGF-β1)
	Pulmonary fibrosis	Alveolar epithelial integrity recovery
Heart	↑cardiac troponin ↑myoglobin ↑creatine kinase ↑NT-proBNP	
	ACE-2 dysregulation ↓angiotensin 1–7 ↑TNFα	↑ myocardial contractility
	Myocarditis/microvascular injury/ microthrombicardiomyopathy	↓ apoptosis ↓oxidative stress
	Hypoxia	↓TNF-α mRNA
	Arrhythmias	Activate resident cardiac stem cells
	Acute cardiac injury with cardiomyopathy, ventricular arrhythmias, and hemodynamic instability	Preserve cardiac function
	Myocardium fibrosis	↓ infarct size ↓ fibrosis
Blood vessels	Endothelial cell infection	
	Hyperperfusion of inefficient alveoli	↑KGF ↑VEGF ↑HGF
	Procoagulant profile:	↓ endothelial cell apoptosis
	↑D-dimer	↓ lung endothelial barrier permeability
	↑fibrin degradation ↑IL-6	↑ angiogenesis
	↑ thrombotic disorders	Preserves endothelial barrier function
	↑COVID severity = ↓platelet	
Kidneys	Directly infect renal epithelia	↓ tubular cell apoptosis
	Tubular injury	↓ inflammatory infiltrate
	Necrotic lesions	↓ TGF-β tissue remodeling ↓ fibrosis
	Epithelium detachment	↑ podocytes function and integrity
	Bowman's capsule rupture	Nephroprotective effects
	Renal dysfunction	Regeneration of renal tubular cells through MSC-derived Evs
	Interstitial fibrosis	
Central nervous system	Direct damage (?)	↓IFN-γ ↓IL-6 ↓TNFα ↓MIP-1α
	Glial cell hyperplasia	↓ microglia activation
	Acute ischemic stroke/cerebral venous sinus thrombosis/cerebral hemorrhage	↑ blood-brain barrier integrity ↑ angiogenesis
	Ischaemic lesions	↓ neurocytotoxicity
	Neuron degeneration	↑ miR-133b ↑ neurovascular recovery and plasticity

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Post-COVID pulmonary fibrosis: therapeutic efficacy using with mesenchymal stem cells – How the lung heals

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INFECTIOUS DISEASES

COVID-19 is an acute respiratory infectious disease caused by SARS-COV 2 (Severe Acute Respiratory Syndrome Coronavirus) that has become a global pandemic. COVID-19 mainly causes the respiratory complications of Acute Respiratory Distress Syndrome (ARDS), cytokine storm, and severe immune disruptions. The assays depict that though people recuperate from COVID-19, there are still symptoms that persists in the body causing discomfort, which is the consequence of the viral infection due to severe immune disruptions. Upon various difficulties of post COVID-19, the pulmonary fibrosis is the stumbling block in the lungs causing severe damage. In this review, we have shown the effectiveness and importance of the Hepatocyte Growth Factor (HGF) secreted by Mesenchymal Stem Cell (MSC) therapy on selective stoppage of the Transforming Growth Factor-Beta (TGF-β) signalling pathway by causing immunomodulatory effects that ameliorate the pulmonary fibrosis through paracrine signalling. However, more pilot studies have to be carried out to determine the efficacy and outcomes of the re-emerging complication.

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Stem Cells Research, Development and Therapy

Short Review

Regenerative Rehabilitation for COVID 19 Sequelae

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Abstract

COVID 19 pandemic has been with us for more than a year now and new insights in pathophysiology and clinical manifestations have emerged. Recent reports have shown that not only is acute COVID a life-threatening disease, but post COVID symptoms are more common than previously thought and may greatly affect quality of life. In this review, we explore the usefulness of regenerative rehabilitation with Mesenchymal Stem Cells (MSC) in post COVID symptoms based on previous knowledge in other medical conditions. We also propose some exercise and MSC regimes that could prove useful for therapy and research based on safety and efficacy data available so far.

irreparable tissues or organs damaged by disease or trauma" [1]. Due to the growing interest in this field, the American Physical Therapy Association has defined it as the "*the integration of principles and approaches from rehabilitation and regenerative medicine, with the ultimate goal of developing innovative and effective methods that promote the restoration of function through tissue regeneration and repair*" [2].

While the majority of research has been conducted in musculoskeletal injuries with encouraging early results [3,4], efforts have also been made in other areas as neurorehabilitation showing promising results in conditions with otherwise poor rehabilitation prognosis, including spinal cord injuries or stroke [5,6]. MSC are one of the most studied alternatives in regenerative therapy given their easy obtention and availability and the observed effects in neurological, autoimmune and musculoskeletal conditions [7].

As this discipline is still in its early stages, mechanisms of action are yet to be totally understood. Nevertheless, based on knowledge to date in each individual therapy, two main mechanisms have been suggested to explain how regenerative medicine added to rehabilitation may exert its effect: first, MSC have the capacity to differentiate into damaged tissue cells and engraft to it, favoring healing. The second hypothesis, and the most accepted to date, lies in MSC potential to release a wide variety of anti-inflammatory and growth factors with paracrine actions that allows regeneration of affected tissue [8].

COVID 19 pandemic has spread rapid over the world, posing a collapse threat to healthcare systems. While Intensive Care Units are cornerstones in early response to the disease, regenerative rehabilitation should play an important role in COVID 19 survivors to prevent disability and to optimize acute inpatient approaches [9,10].

COVID 19 Sequelae, New Information by the Day

As time passes, new information about COVID 19 consequences

REVIEW Open Access

Stem cells and COVID-19: are the human amniotic cells a new hope for therapies against the SARS-CoV-2 virus?

Rodrigo N. Riedel[1], Antonio Pérez-Pérez[2], Víctor Sánchez-Margalet[2], Cecilia L. Varone[1] and Julieta L. Maymó[1*]

Abstract

A new coronavirus respiratory disease (COVID-19) caused by the SARS-CoV-2 virus, surprised the entire world, producing social, economic, and health problems. The COVID-19 triggers a lung infection with a multiple proinflammatory cytokine storm in severe patients. Without effective and safe treatments, COVID-19 has killed thousands of people, becoming a pandemic. Stem cells have been suggested as a therapy for lung-related diseases. In particular, mesenchymal stem cells (MSCs) have been successfully tested in some clinical trials in patients with COVID-19. The encouraging results positioned MSCs as a possible cell therapy for COVID-19. The amniotic membrane from the human placenta at term is a valuable stem cell source, including human amniotic epithelial cells (hAECs) and human mesenchymal stromal cells (hAMSCs). Interestingly, amnion cells have immunoregulatory, regenerative, and anti-inflammatory properties. Moreover, hAECs and hAMSCs have been used both in preclinical studies and in clinical trials against respiratory diseases. They have reduced the inflammatory response and restored the pulmonary tissue architecture in lung injury in vivo models. Here, we review the existing data about the stem cells use for COVID-19 treatment, including the ongoing clinical trials. We also consider the non-cellular therapies that are being applied. Finally, we discuss the human amniotic membrane cells use in patients who suffer from immune/inflammatory lung diseases and hypothesize their possible use as a successful treatment against COVID-19.

Keywords: COVID-19, SARS-CoV-2, Stem cells, Stem cell therapy, Mesenchymal stem cells, Amnion, Human amniotic epithelial cells, Human amniotic mesenchymal stromal cells

Astragalus

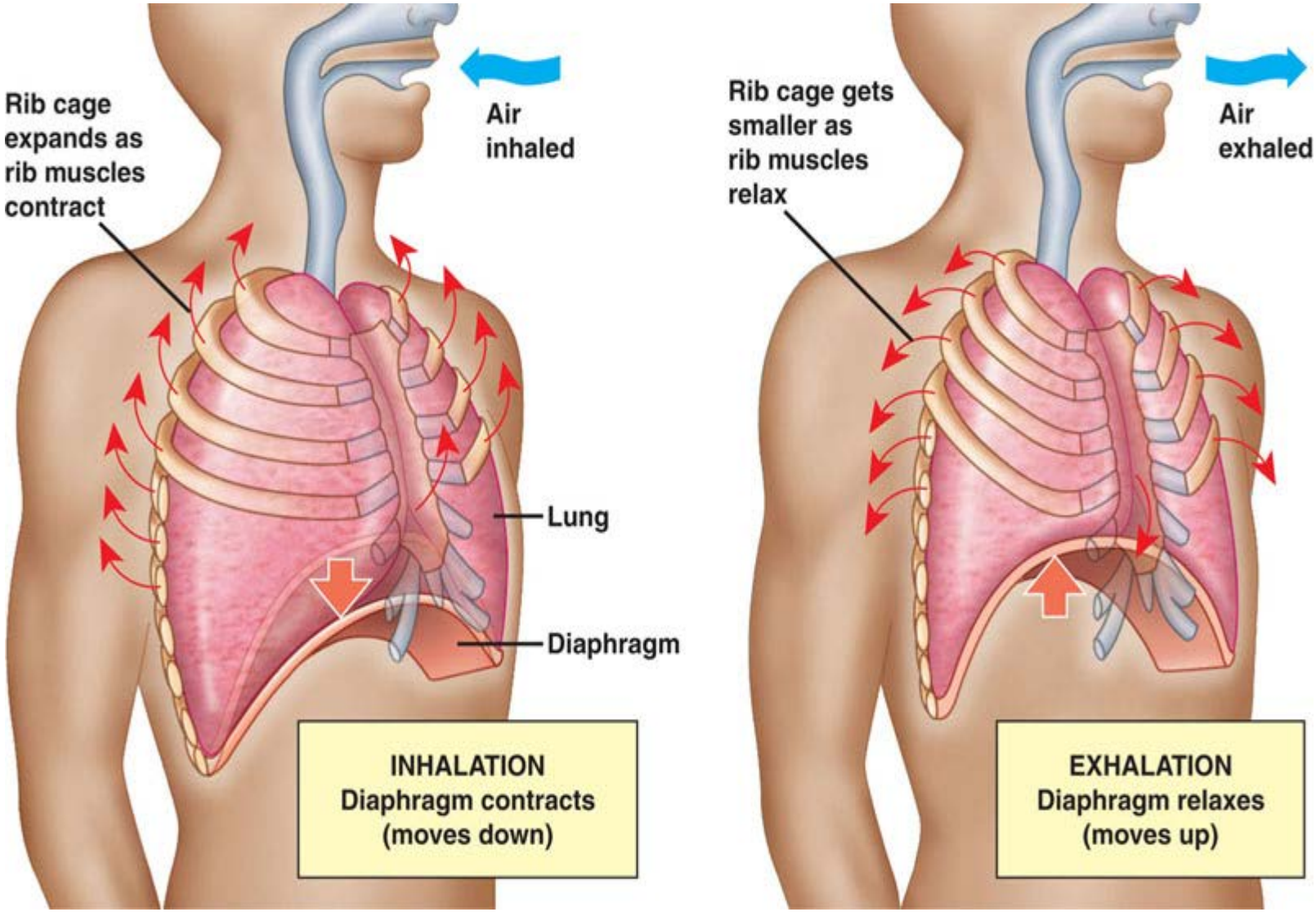
- Telomerase activator
- Tissue healing
- ACE2 down regulator

Cordycept

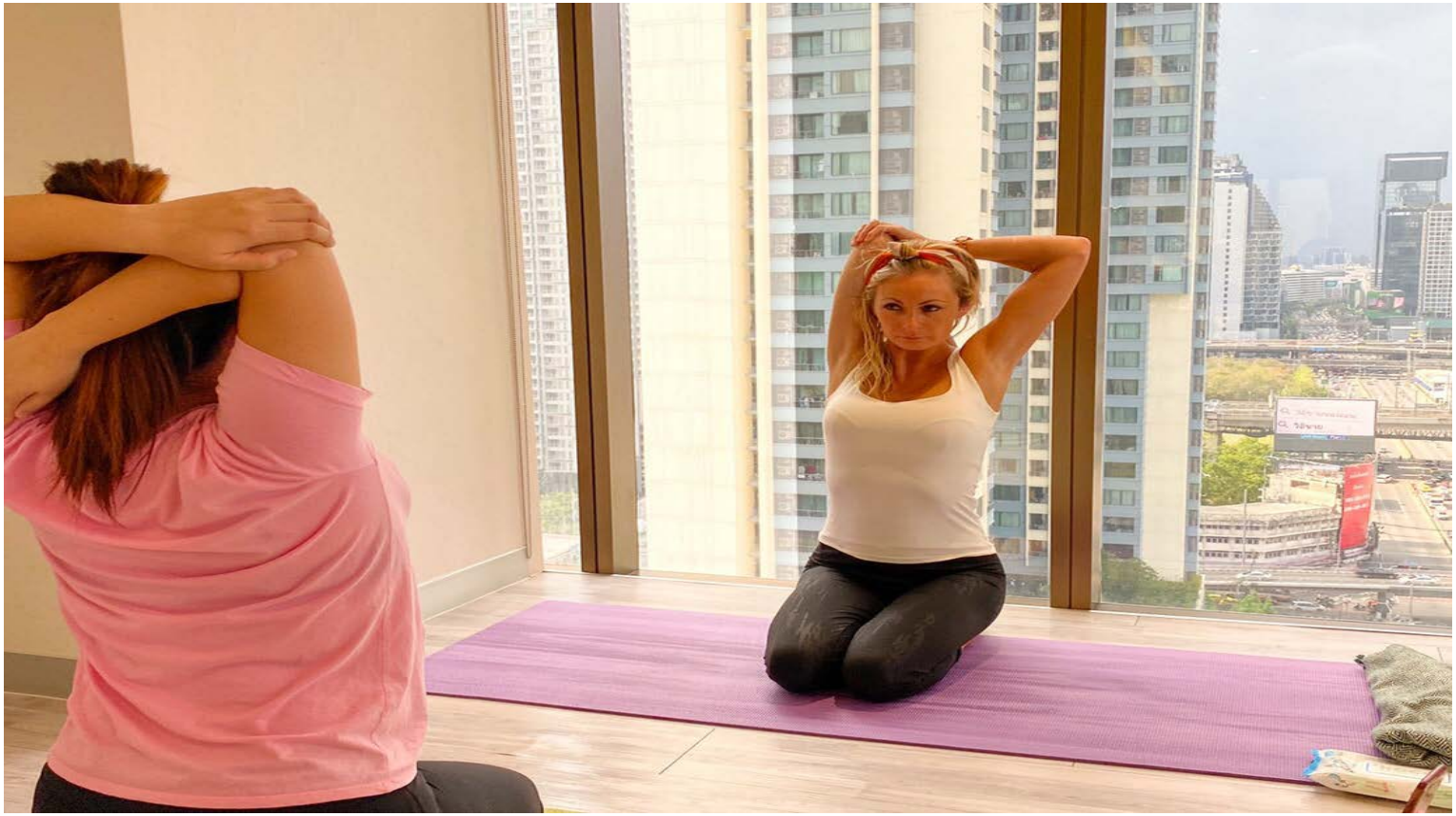
- Cordycepin – ATP like molecule ; energy support
- Improve lung function
- Improve adrenal function

สมาธิ-ดนตรีบำบัด กับระบบประสาท

Breathing Detoxification



Yoga & Breathing exercise



การฝึกโยคะ เป็นการฝึกหายใจ ให้ยาว ลึก ซึ่งเป็นการสูดอ็อก ซิเจนเข้าไปหล่อเลี้ยงร่างกาย สร้างสิ่งแวดล้อมภายในร่างกายให้เต็มไปด้วย อ็อกซิเจน นอกจากนี้การฝึกโยคะยังช่วยลดความตึงเครียดทั้งทางร่างกายและจิตใจให้ผ่อนคลายมากยิ่งขึ้น และยังเสริมปรับสมดุลการทำงานของระบบในร่างกายให้สามารถทำงานได้เต็มประสิทธิภาพ

Adv Mind Body Med. 2017 Fall;31(4):10-25.

The Effects of Stress and Meditation on the Immune System, Human Microbiota, and Epigenetics.

Household AM, Peterson CT, Mills PJ, Chopra D.

Abstract

Context • Globally, more than 25% of individuals are affected by anxiety and depression disorders. Meditation is gaining popularity in clinical settings and its treatment efficacy is being studied for a wide array of psychological and physiological ailments. An exploration of stress physiology is an essential precursor to delineation of the mechanisms underlying the beneficial effects of meditation practices. Objective • The review outlines a model of interconnected physiological processes that might support the continued inclusion and expansion of meditation in the treatment of diverse medical conditions and to investigate the role that gut microbiota may play in realizing well-being through meditation. Design • The authors conducted a scientific literature database search with the goal of reviewing the link between stress management techniques and human microbiota. Their goal was also to identify the extent of underlying epigenetic reactions in these processes. The review was completed in approximately 2 y. Databases searched included Medline via PubMed and Ovid, PsycINFO via Ovid, Spinet, ProQuest Central, SAGE Research Methods Online, CINAHL Plus with Full Text, Science Direct, Springer Link, and Wiley Online Library. Keywords searched included, but were not limited to, stress, meditation, mindfulness, immune system, HPA axis, sympathetic nervous system, parasympathetic nervous system, microbiota, microbiome, gut-barrier function, leaky gut, vagus nerve, psychoneuroimmunology, epigenetic, and NF-κB. Setting • The study took place at New York University (New York, NY, USA), the University of California, San Diego (La Jolla, CA, USA), and the Chopra Foundation (Carlsbad, CA, USA). Results • Psychological stress typically triggers a fight-or-flight response, prompting corticotropin-releasing hormone and catecholamine production in various parts of the body, which ultimately disturbs the microbiota. In the absence of stress, a healthy microbiota produces short-chain fatty acids that exert anti-inflammatory and antitumor effects. During stress, an altered gut microbial population affects the regulation of neurotransmitters mediated by the microbiome and gut barrier function. Meditation helps regulate the stress response, thereby suppressing chronic inflammation states and maintaining a healthy gut-barrier function. Conclusions • The current research team recommends the integration of meditation into conventional health care and wellness models. Concurrently, studies to explore the effects of meditation on human microbiota are warranted.

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Thank you