Ivermectin

A Review of Pertinent Drug Information for SARS-CoV-2

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Data as of March 22, 2021

Dosing

- Most helminth infections: 200 mcg/kg as a single dose
- Lice, scabies: 200-400 mcg/kg every 7 days x 2-3 doses
- Crusted scabies: 200 mcg/kg days 1, 2, 8, 9, 15
- Doses for children ≥ 15 kg are similar to adult doses

- Available as a 3 mg tablet

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Ivermectin [package insert]. Parsippany, NJ 07054: Edenbridge Pharmaceuticals;2012.
Vora A, et al. *Indian J Tuberc* 2020;67:448-51.

Pharmacokinetics

- Drug-drug interactions: may increase anticoagulant effect of warfarin
- Food: bioavailability is increased 2.5-fold when administered following a high fat meal
- Hepatic metabolism via CYP3A4
- No renal or hepatic dose adjustments required

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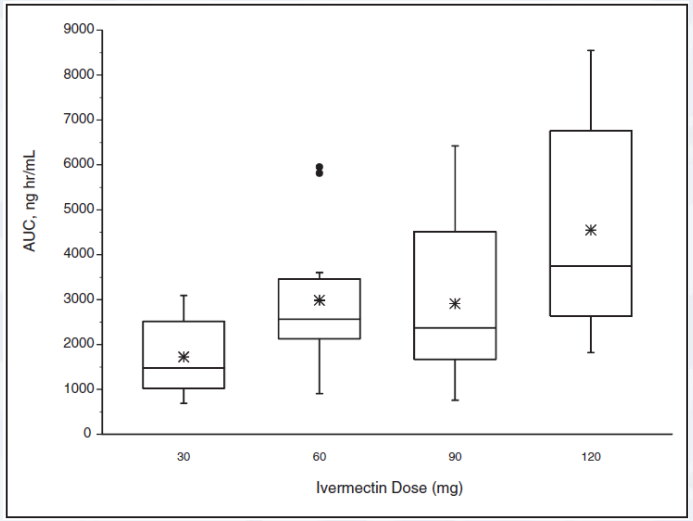
Ivermectin [package insert]. Parsippany, NJ 07054: Edenbridge Pharmaceuticals;2012.

Pharmacokinetics

- Peak after standard dose of 200 mcg/mL ~50 ng/mL
- Escalating dose study up to 2000 mcg/kg achieve levels of 250 ng/mL
- Increases in Cmax and AUC

  are proportional and predictable



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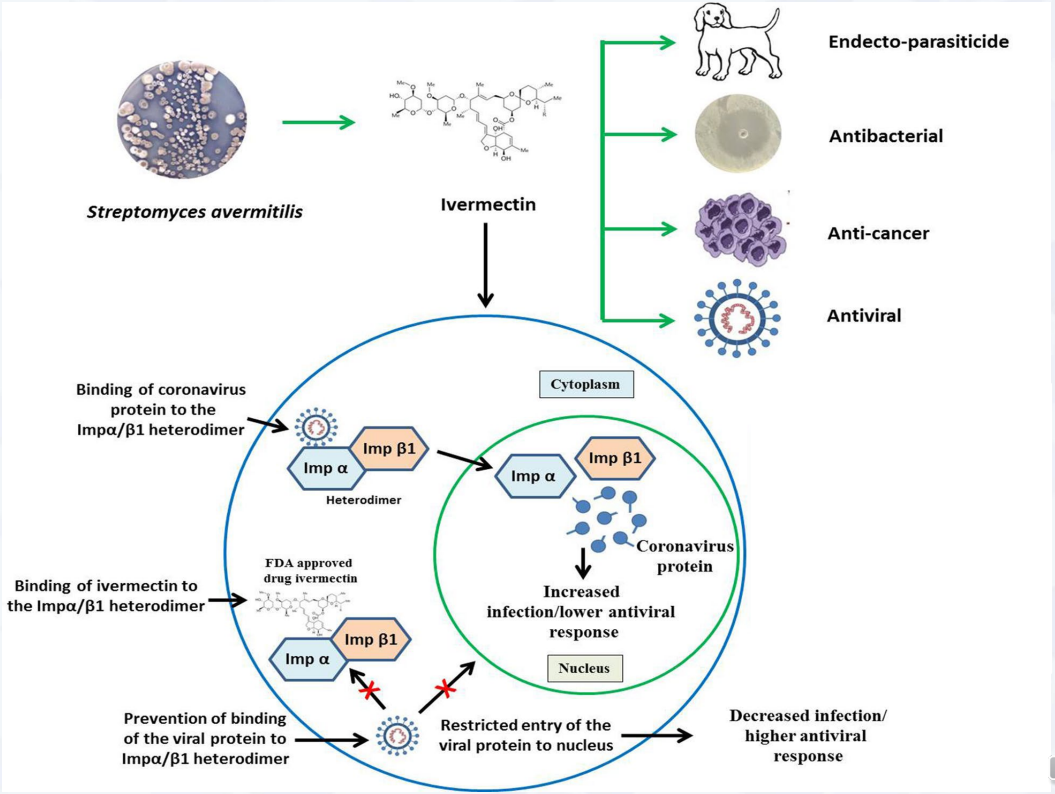
Guzzo CA, et al. *J Clin Pharmacol* 2002;42:1122-33.

Mechanism of Action - Viruses

Broad spectrum, antiviral activity against animal and human viruses, including RNA and DNA viruses



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Sharun et al. *Ann Clin Microbiol Antimicrob* 2020;19:23. https://doi.org/10.1186/s12941-020-00368-w

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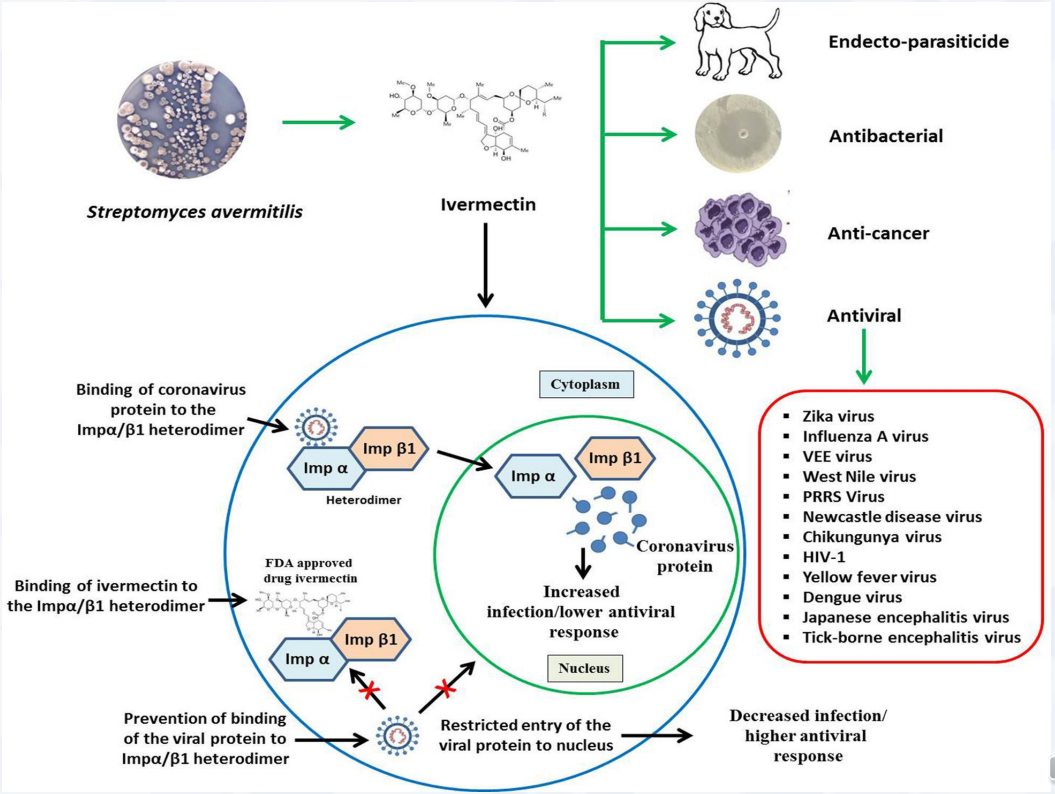

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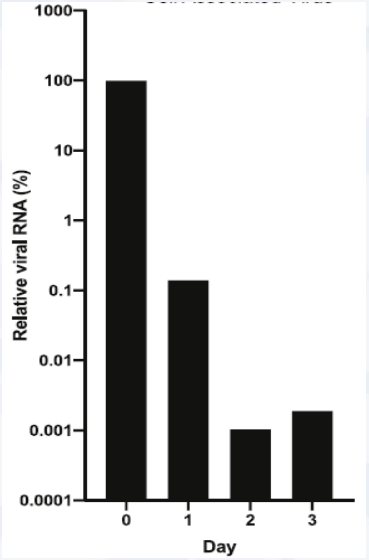
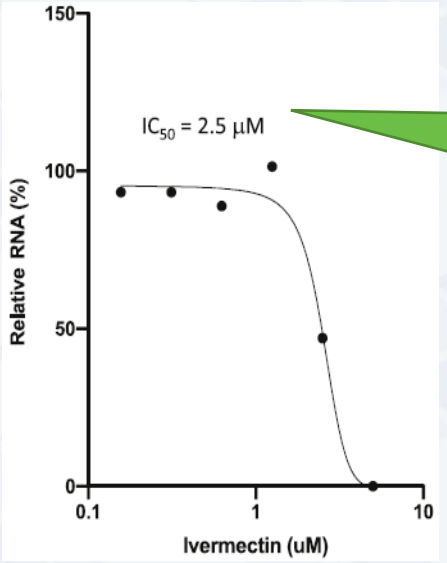
Sharun et al. *Ann Clin Microbiol Antimicrob* 2020;19:23. https://doi.org/10.1186/s12941-020-00368-w

In vitro Data – SARS-CoV-2

- Caly and colleagues found that the addition of 5 µM of ivermectin to Vero-hSLAM cells infected with SARS-CoV-2 resulted in a reduction in viral RNA by 99.98% at 48 hrs.

5000-fold reduction in viral load!





Concentration needed to reduce viral load by 50%

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Caly L, et al. *Antiviral Res* 2020;178:104787. doi.org/10.1016/j.antiviral.2020.104787.

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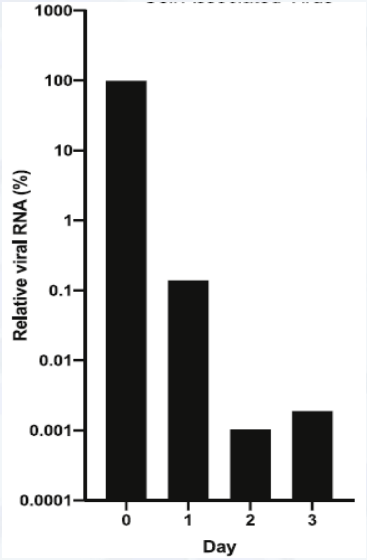

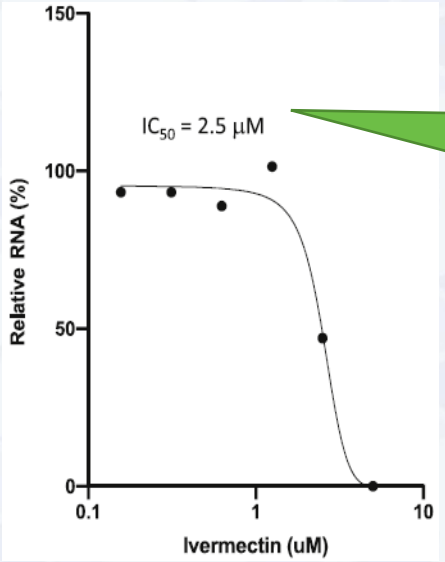

Concentration needed to reduce viral load by 50%

Authors' conclusion: Ivermectin warrants further investigation

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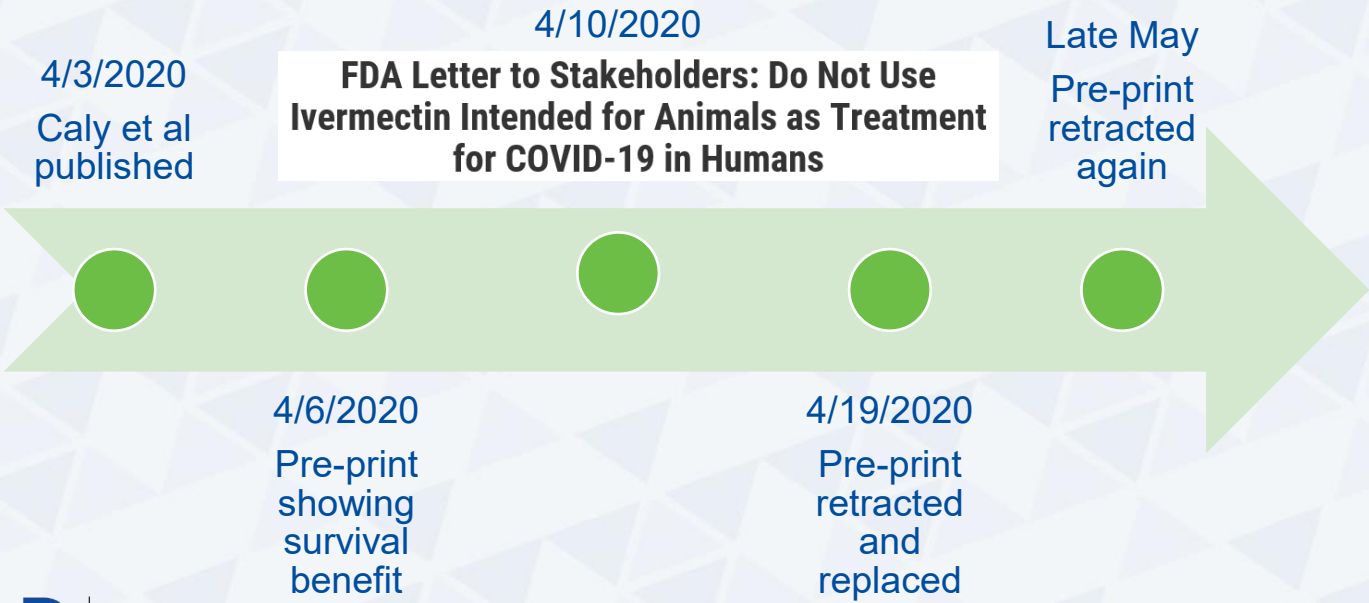
Ivermectin Frenzy



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Caly L, et al. *Antiviral Res* 2020;178:104787. doi.org/10.1016/j.antiviral.2020.104787.
FDA Letter to Stakeholders. https://www.fda.gov/animal-veterinary/product-safety-information/fda-letter-stakeholders-do-not-use-ivermectin-intended-animals-treatment-covid-19-humans

Ivermectin Frenzy

4/3/2020

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Ivermectin Frenzy

Gobierno del Estado Plurinacional de
BOLIVIA
Ministerio de Salud

4/3/2020

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Ministerio de Salud autoriza uso de ivermectina contra el COVID-19 bajo protocolo

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Resolución Ministerial

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SMS Natal adota uso da ivermectina contra a covid-19

Publicação: 2020-06-06 00:00:00

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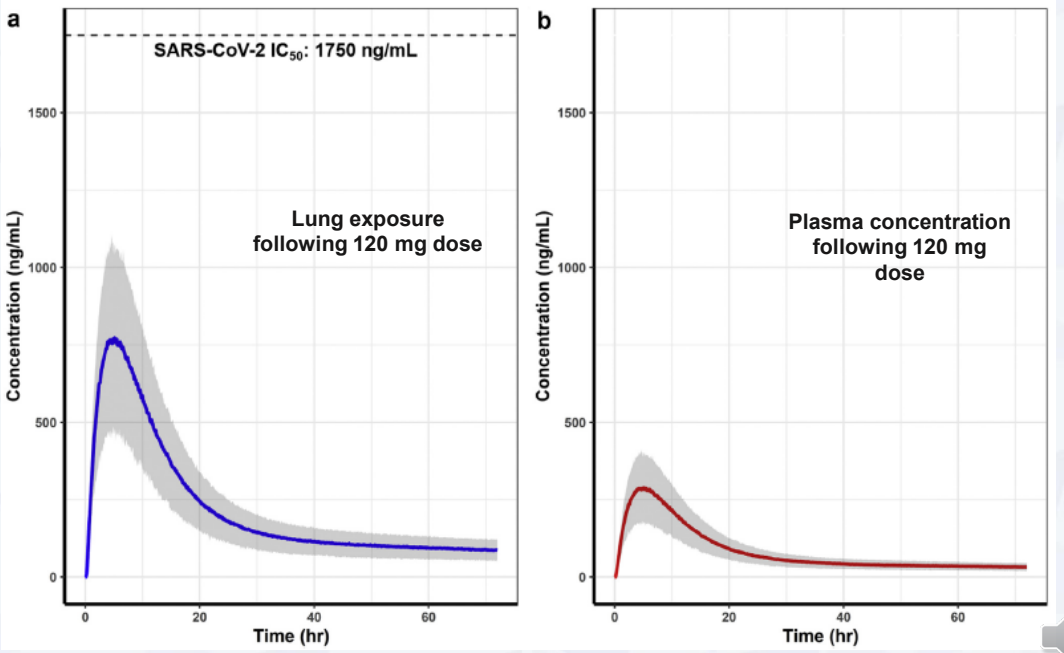
Ivermectin Exposure

Development of a Minimal Physiologically-Based Pharmacokinetic Model to Simulate Lung Exposure in Humans Following Oral Administration of Ivermectin for COVID-19

- Ivermectin plasma and lung concentrations in calves were used to determine plasma:lung tissue partition coefficient
- Data from published PK studies in humans were used to develop a mPBPK model
- Model was used to simulate human lung exposure to ivermectin after 12, 30, and 120 mg oral doses



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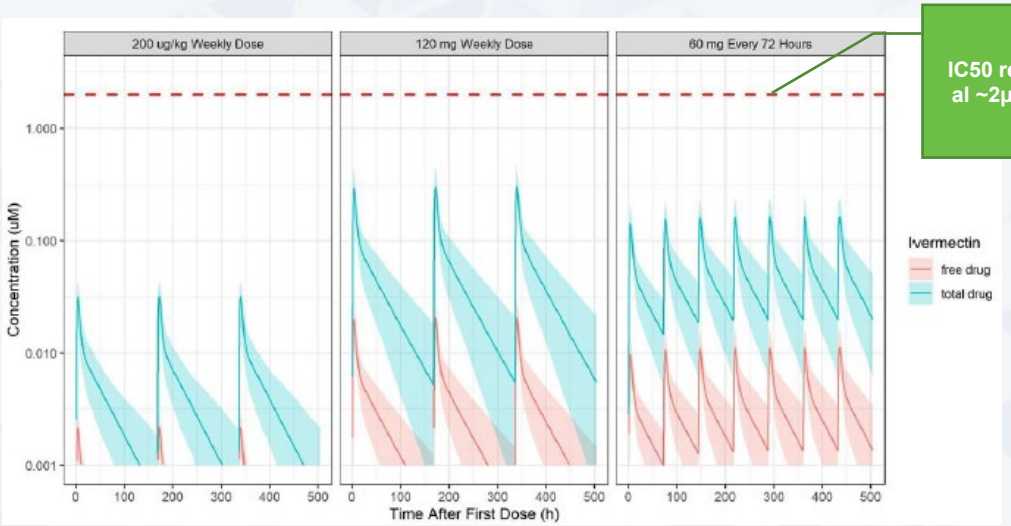
Jermain B, et al. *J Pharm Sci* 2020:https://doi.org/10.1016/j.xphs.2020.08.024.

Ivermectin Exposure

The Approved Dose of Ivermectin Alone is not the Ideal Dose for the Treatment of COVID-19

- Analysis conducted to evaluate what doses in humans would potentially result in lung concentrations reaching IC50
- A population PK model was used

  to simulate the following doses:
  - 200 mcg/kg q7d x 3 doses
  - 120 mg x 1 dose
  - 60 mg q72h x 3 doses



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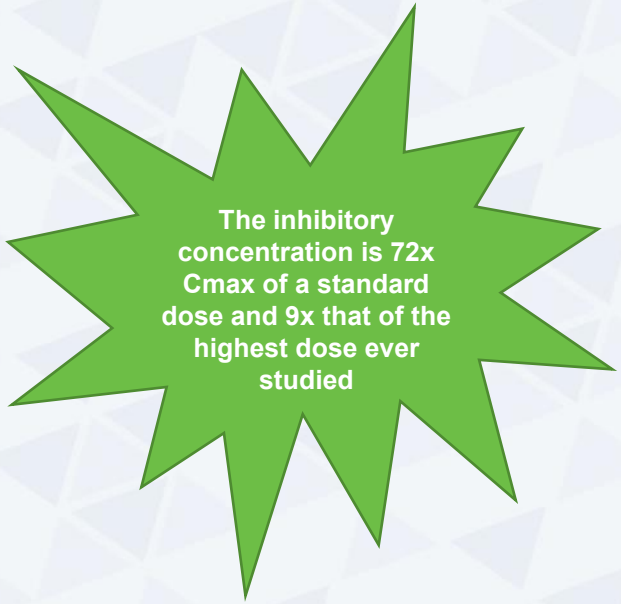
Schmith V, et al. *Clin Pharmacol Ther* 2020;108(4):762-65. doi: 10.1002/cpt.1889.

Ivermectin Exposure

PK study	Dose	Cmax - plasma (ng/mL)	Inhibitory concentrations (ng/mL) IC50
Krishna et al., 1993	12 mg (150-200 µg/kg)	30.4	-
Munoz, et al., 2018	36 mg (550-700 µg/kg)	96.2	-
Guzzo et al., 2002	120 mg (1400-2000 µ/kg)	247.8	-
Caly et al., 2020	5 µM	-	2190 (converted from 2.5 µM/L as reported in the study)



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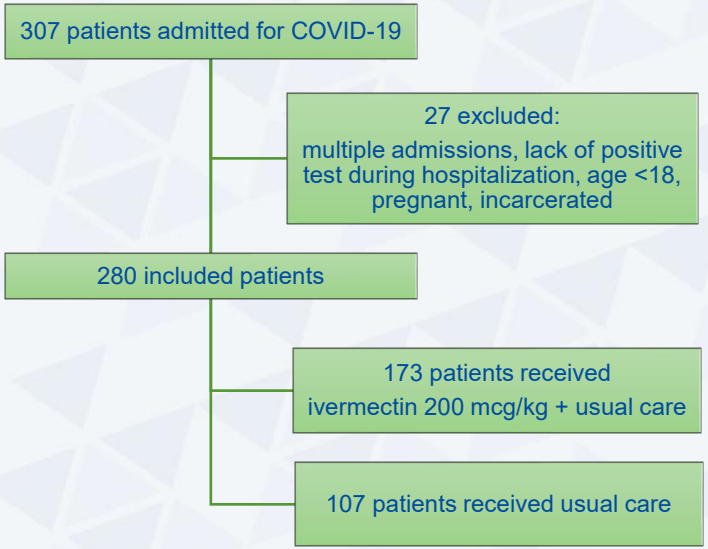
Momekov G, et al. *Biotechnol. Biotechnol. Equip* 2020;34(1):469-474, DOI: 10.1080/13102818.2020.1775118

ICON (Ivermectin in COvid Nineteen study)

Retrospective, cohort study in 4 Florida hospitals



SIDP SOCIETY OF INFECTIOUS DISEASES PHARMACISTS

Rajter JC, et al. *CHEST* 2020: S0012-3692(20)34898-4. doi: 10.1016/j.chest.2020.10.009

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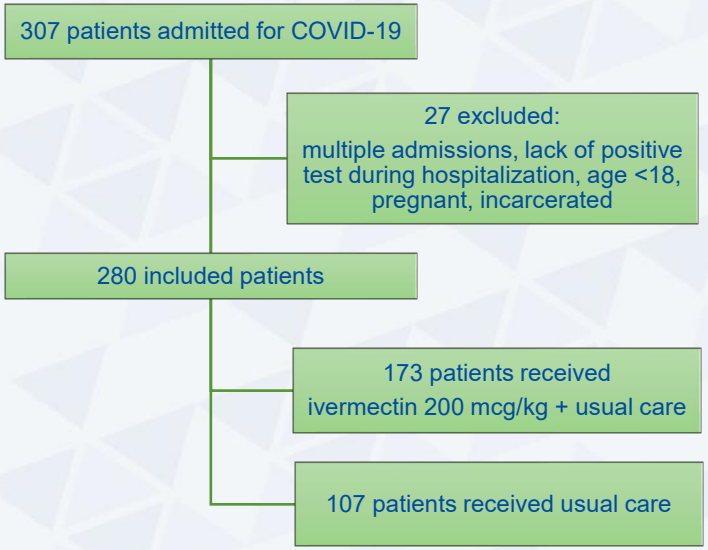

	Unmatched Cohort		
Characteristics	Usual Care n=107 (%)	Ivermectin n=173 (%)	P value
Age, years (± SD)	58.6 (18.5)	60.2 (17.6)	0.45
Female sex	43 (41.2)	84 (48.6)	0.17
Race ethnicity **Black** **White** **Hispanic** **Other**	 55 (51.4) 35 (32.7) 12 (11.2) 13 (4.6)	 98 (56.6) 41 (23.7) 21 (12.1) 13 (7.5)	0.36
Diabetes	31 (29.0)	59 (34.1)	0.37
Obesity	42 (39.3)	72 (41.6)	0.70
Hypertension	13 (12.2)	37 (21.4)	**0.05**
Severe disease*	26 (24.3)	49 (28.3)	0.12
Corticosteroids	21 (19.6)	69 (39.8)	**0.001**
Hydroxychloroquine	104 (97.2)	156 (90.2)	**0.03**
Azithromycin	99 (92.5)	144 (83.2)	**0.03**

*Severe disease: FiO2 ≥50%, high-flow nasal oxygen, noninvasive or mechanical ventilation

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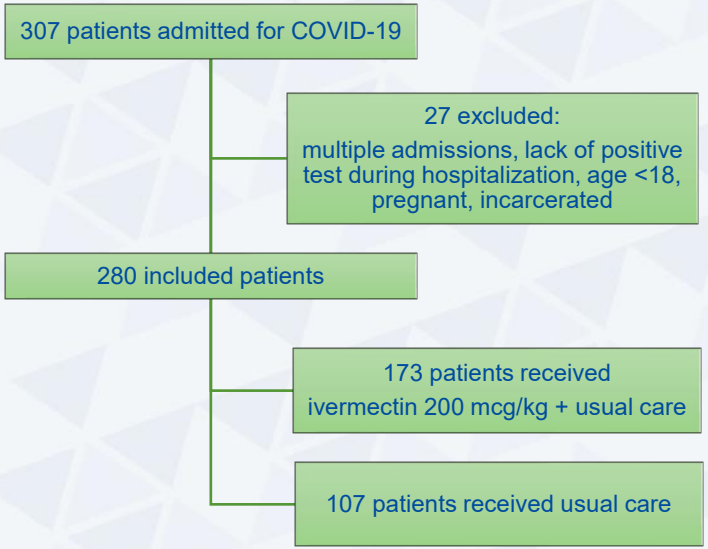

	Unmatched Cohort			Matched Cohort		
Characteristics	Usual Care n=107 (%)	Ivermectin n=173 (%)	P value	Usual Care n=98	Ivermectin n=98	P value
Age, years (± SD)	58.6 (18.5)	60.2 (17.6)	0.45	59.0 (17.7)	60.1 (17.4)	0.68
Female sex	43 (41.2)	84 (48.6)	0.17	39	39	1
Race ethnicity **Black** **White** **Hispanic** **Other**	 55 (51.4) 35 (32.7) 12 (11.2) 13 (4.6)	 98 (56.6) 41 (23.7) 21 (12.1) 13 (7.5)	0.36	 54 27 12 5	 54 28 11 5	1
Diabetes	31 (29.0)	59 (34.1)	0.37	30	29	0.88
Obesity	42 (39.3)	72 (41.6)	0.70	39	40	0.88
Hypertension	13 (12.2)	37 (21.4)	**0.05**	12	14	0.67
Severe disease*	26 (24.3)	49 (28.3)	0.12	22	25	0.62
Corticosteroids	21 (19.6)	69 (39.8)	**0.001**	21	25	0.5
Hydroxychloroquine	104 (97.2)	156 (90.2)	**0.03**	95	95	1
Azithromycin	99 (92.5)	144 (83.2)	**0.03**	90	87	0.47

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ICON (Ivermectin in COvid Nineteen study)

Univariate Clinical Outcomes

	Unmatched Cohort				Matched Cohort			
Outcomes	**Usual Care n=107**	**Ivermectin n=173**	**OR (CI)**	**P value**	**Usual Care n= 98**	**Ivermectin n=98**	**OR (CI)**	**P value**
Total mortality	27 (25.2)	26 (15.0)	0.52 (0.29-0.96)	0.03	24	13	0.47 (0.22-0.99)	0.045
Mortality in those with severe disease	21/26 (80.7)	19/49 (38.8)	0.15 (0.05-0.47)	0.001	18/22 (81.8)	8/25 (32.0)	0.27 (0.08-0.92)	0.002
Successful extubation	4/26 (15.4)	13/36 (36.1)	3.11 (0.88-11.00)	0.07	3/22 (15.4)	7/18 (38.9)	1.91 (0.43-8.46)	0.14
Length of stay, median (IQR)	7.0 (4.0, 10.0)	7.0 (4.0, 13.3)	0 (-2 to 1)	0.34	7 (4-10)	7 (3-13)	0 (-2 to 1)	0.88

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Multivariate Clinical Outcomes

Variable	OR (95% CI)	P value
Ivermectin	0.27 (0.09-0.80)	0.03
Age	1.05 (1.02-1.09)	0.003
Severe presentation	11.41 (3.42-38.09)	<0.001

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ICON (Ivermectin in COvid Nineteen study)

Limitations:

- Retrospective
- More corticosteroid use in ivermectin group
- Use of hydroxychloroquine and azithromycin
- Control group enrolled early in the trial

Authors conclude: “Further studies in appropriately designed randomized trials are recommended before any conclusions can be made.”

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Rajter JC, et al. *CHEST* 2020: S0012-3692(20)34898-4. doi: 10.1016/j.chest.2020.10.009

Effectiveness of Ivermectin as Add-On Therapy

- Pilot, interventional, single center study with synthetic control arm

Inclusion:

- Adults ≥ 18 years old
- Hospital admission
- Mild-moderate COVID-19 with +SARS-CoV-2 PCR

Exclusion:

- Severe COVID-19 (O_2 saturation ≤93% on room air, ≥30 breaths/min)

Ivermectin 200 mcg/kg x 1 dose + HCQ 400 mg BID x 1 day, then 200 mg BID x 4 days + Azithromycin 500 mg x 1 dose, then 250 mg daily x 4 days

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Gorial FI, et al. 2020. medRxiv preprint doi: https://doi.org/10.1101/2020.07.07.20145979

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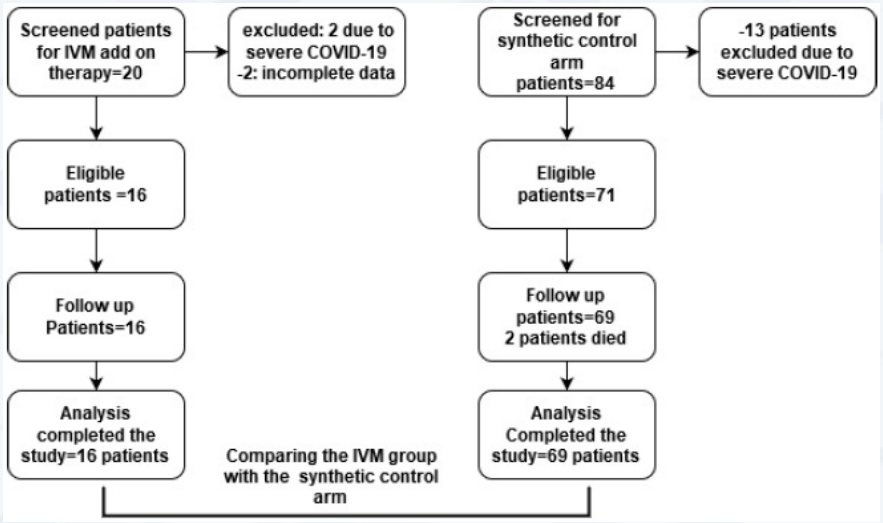

Variables	Ivermectin=16	Controls=71	P value
Age, mean ± SD (range)	44.87 ± 10.64 (28- 60)	45.23 ± 18.47 (8-80)	0.78
Male	11 (69)	52 (73)	0.72
Severity Mild Moderate	 9 (56) 7 (44)	 40 (56) 31 (44)	1.00
Diabetes	3 (19)	15 (21)	0.83
Hypertension	3 (19)	14 (20)	0.79

Outcome	Ivermectin=16	Controls=71
Cure	16 (100)	69 (97.2)
Mortality	0	2 (2.8)
*Length of stay, days, mean ± SD	7.62 (2.75)	13.22 (5.90)

*P value = 0.00005, no p value reported for other outcomes

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Conclusion: When added to hydroxychloroquine/azithromycin, ivermectin contributed to a shorter length of stay. Larger prospective studies are needed to validate these data.

Gorial FI, et al. 2020. medRxiv preprint doi: https://doi.org/10.1101/2020.07.07.20145979

Ivermectin RCT in Outpatients

- Open-label, randomized controlled trial in Bangladesh
- Included adult outpatients with mild-moderate disease with +SARS-CoV-2
  - Excluded patients taking hydroxychloroquine or symptoms >7 days
- Ivermectin 200 mcg/kg x 1 dose + standard of care (SOC) vs SOC alone
  - SOC = antipyretics, cough suppressant, and doxycycline 100 mg bid x 7d

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Podder CS, et al. *IMC J Med Sci* 2020;14(2):002. *Epub.*

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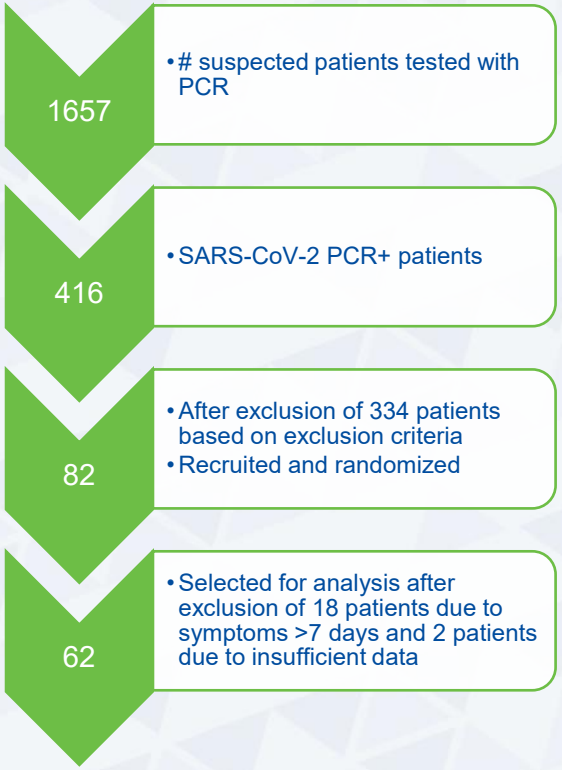

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Podder CS, et al. *IMC J Med Sci* 2020;14(2):002. *Epub.*

Ivermectin RCT in Outpatients

Characteristics	Control n=30 (%)	Ivermectin n=32 (%)	P value
Age, yrs, mean ± SD	40 ± 13	38 ± 11	>0.05
Male	21 (70.0)	23 (71.9)	>0.05
Severity of illness			>0.05
Mild	24 (80.0)	26 (81.3)	
Moderate	6 (20.0)	6 (18.8)	
Presenting symptoms (select)			>0.05
Fever	23 (76.7)	27 (84.4)	
Cough	21 (70.0)	21 (65.6)	
Shortness of breath	6 (20.0)	6 (18.8)	
Fatigue	7 (23.3)	5 (15.6)	
Myalgia	8 (26.7)	14 (43.8)	

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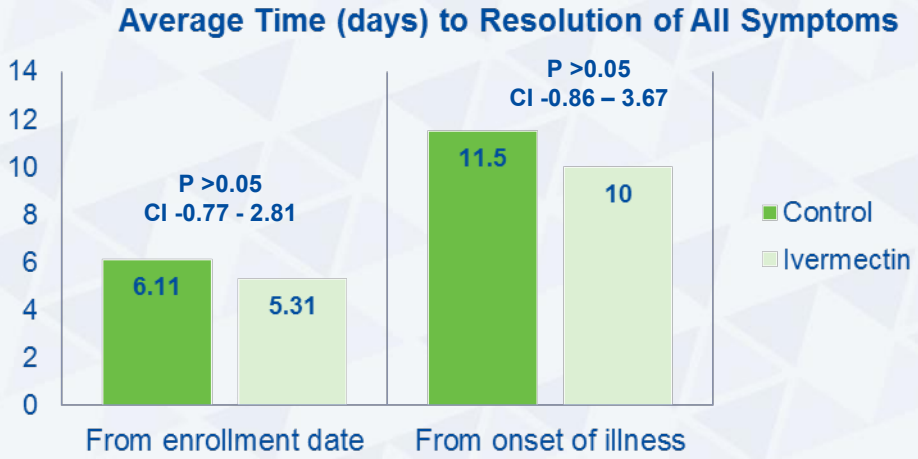

Table-5: *Result of repeat RT-PCR on 10th day (n=40)*

Repeat RT-PCR test	Intervention arm n (%)	Control arm n (%)	Sig
Positive	2 (10)	1(5)	p>.05
Negative	18 (90)	19 (95)	
Total	20	20	

Conclusion:
Ivermectin had no benefit on disease course in mild-moderate disease

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Podder CS, et al. *IMC J Med Sci* 2020;14(2):002. *Epub.*

Ivermectin RCT in Outpatients

A Comparative Study on Ivermectin and Hydroxychloroquine on COVID-19 Patients in Bangladesh

Purpose

To compare ivermectin + doxycycline (IVMD) with hydroxychloroquine + azithromycin (HCQA)

Ivermectin 200 mcg/kg x1
Doxycycline 100 mg BID x10d
HCQ 400 mg BID x1d, 200 mg BID x9d
Azithromycin 500 mg daily x5d

Methods

Included outpatients +SARS-CoV-2

Excluded asthma, COPD, ischemic heart disease, uncontrolled diabetes, advanced renal or hepatic disease, carcinoma, immunocompromised

Excluded O_2 saturation <95%

Excluded abnormal chest xray

Results

181 assessed for eligibility
IVMD = 60
HCQA = 56

Male: IVMD 72% HCQA 84%
Age: IVMD 36 y HCQA 32 y
Symptomatic: IVMD 78% HCQA 75%

Results

Time to negative PCR (days): IVMD 8.9 HCQA 9.3

Time to symptom recovery (days): IVMD 5.9 HCQA 7.0

Adverse effects: IVMD 31.7% HCQA 46.4%

Conclusion

No statistically significant findings, but possible trend towards advantage with ivermectin + doxycycline

Larger scale trial is needed

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Chowdhury AT, et al. pre-print. https://doi.org/10.21203/rs.3.rs-38896/v1

Update – Observational Studies

Study	Study design / Population	Intervention	Primary outcome	Results
Bhattacharya R, et al. (pre-print)	Case series / 148 Hospitalized patients (67.5% mild, 27.5% moderate, 5% severe)	IVM (single dose) + atorvastatin + N-acetyl-cysteine	Mortality and discharge	Mortality rate: 1.4% (2/148) Average length of stay: 12 days
Carvallo H, et al. (pre-print)	Prospective, observational / Inpatients and outpatients 135 mild disease 32 moderate-severe disease	IVM 24 – 48 mg d0 and d7 + dexamethasone + enoxaparin/aspirin	Percentage of patients that progressed to moderate or severe disease Mortality	Mortality rate: 0.6% (1/167) None of the mild cases progressed
Morgenstern J, et al. (pre-print)	Retrospective observational / Inpatients and outpatients	Outpatients IVM 400 mcg/kg x1 + azithromycin x 5d (n=2706) Inpatients IVM 300 mcg/kg d1,2,6,7 + azithromycin x 7d + dexamethasone if required supplemental oxygen (n=411)	Mortality Disease progression	Outpatients: 0.59% progressed to require hospitalization Inpatients: 9% mortality rate -Critically ill: 30.6% mortality rate
Alam MT, et al.	Case series / mild (n=73), moderate (n=20), severe (n=7)	IVM 200 mcg/kg x 1 + doxycycline x 10d	Symptomatic improvement and follow-up PCR results	Mild-mod: 50% had symptomatic improvement between d3-5 Severe: 50% had symptomatic improvement by d7 No ICU admissions or deaths All subsequent PCR tests were negative (d4-18)

IVM = ivermectin, d = day, HCQ = hydroxychloroquine

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The main limitation is that these are observational with no comparator.

Bhattacharya R, et al. pre-print. https://doi.org/10.1101/2020.08.12.20170282
Carvallo H, et al. pre-print. doi: https://doi.org/10.1101/2020.09.10.20191619
Morgenstern J, et al. pre-print. https://doi.org/10.1101/2020.10.29.20222505
Alam MT, et al. Bangladesh Coll Phys Surg 2020; 38: 10-15). DOI: https://doi.org/10.3329/jbcps.v38i0.47512

Update – Non-Randomized Studies

Study	Study design / Population	Intervention	Primary outcome	Results
Spoorthi V, et al.	Prospective, placebo-controlled study / Hospitalized with mild-mod COVID 19	IVM 200 mcg/kg x1 dose + doxy x 7d (n=50) vs Placebo (n=50)	Establish efficacy of IVM + doxycycline	IVM + doxycycline had shorter hospital stay and faster time to resolution of symptoms
Camprubi D, et al.	Retrospective cohort study / Hospitalized patients with severe disease	IVM 200 mcg/kg x 1 dose (n=13) No IVM (n=13)	Clinical and microbiological outcomes	No difference
Behera P, et al. (pre-print)	Matched case-control / Prophylaxis of HCW	186 matched pairs → 115 participants w/hx of IVM ppx (77 controls, 38 cases)	Diagnosis of COVID infection	IVM ppx associated with lower risk of infection
Alam MT, et al.	Observational / HCW prophylaxis	IVM 12 mg every 4 weeks x 4 months (n=58) Controls (n=60)	Effectiveness of ivermectin when administered as pre-exposure prophylaxis for COVID-19	IVM: 6.9% developed COVID-19 Control: 73.3% developed COVID-19
Gomez-Hernandez MT, et al.	Retrospective cohort study / Hospitalized patients with mild-moderate disease	IVM 12 mg x 1 + SOC (n=115) SOC (n = 133)	Time to SARS-CoV-2 negativity, disease progression, duration of hospital stay, mortality	Shorter time to negative PCR and shorter hospital stay in the IVM group. Lower mortality in IVM group.

IVM = ivermectin, d = day, n = number, SOC = standard of care, HCW = healthcare workers, ppx = prophylaxis, hx = history

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Limitations:

- Non-randomized
- Use of other therapies
- Lack of detail in methodology
- Small sample sizes

Spoorthi V, et al. *IAIM* 2020; 7(10): 177-182.
Camprubi D, et al. *PLoS ONE* 2020;15(11): e0242184. https://doi.org/10.1371/journal.pone.0242184
Behera P, et al. pre-print. https://doi.org/10.1101/2020.10.29.20222661
Alam MT, et al. *EJMED* 2020. 2(6): http://dx.doi.org/10.24018/ejmed.2020.2.6.599
Gomez-Hernandez MT, et al. *Arch Bronconeumol*. 2020;56(12):816–830

Update – RCTs, Open-Label

Study	Population	Intervention	Primary outcome	Results
Krolewiecki A, et al. (pre-print)	Hospitalized patients with mild-moderate COVID-19	IVM 600 mcg/kg x 5d (n=30) vs Control (n=15)	Viral load reduction in respiratory secretions at d5	No difference in viral load between groups.
Hashim HA, et al. (pre-print)	Inpatients and outpatients ranging from mild-critical illness	IVM 200 mcg/kg x2-3d + doxycycline 100 bid for 5-10d + SOC (n=70) vs SOC (n=70)	Time to recovery, progression of disease, and mortality	7 day faster time to recovery with IVM + doxycycline. No difference in rate of progression or mortality
Chachar AZK, et al.	Outpatients with mild COVID-19	IVM 12 mg x 3 doses (n=25) Control (n=25)	Response at d7	No difference in response at d7
Elgazzar A, et al. (pre-print)	Inpatients and outpatients/treatment and prophylaxis	G1: 100 pts mild-mod IVM 400 mcg/kg x 4d + SOC G2: 100 pts mild-mod HCQ + SOC G3: 100 pts severe IVM 400 mcg/kg x 4d + SOC G4: 100 pts severe HCQ + SOC G5: 100 HCW or household contacts IVM 400mcg/kg x 1 repeated in 7d + PPE G6: 100 HCW or household contacts PPE only	Lab improvements, PCR conversion, hospital stay	Significant improvement in lab parameters and PCR conversion at day 7. Prognosis was improved and hospital duration was shorter in IVM groups compared to HCQ groups. HCW and household contacts had lower conversion rate.

d = day, pts = patients, HCQ = hydroxychloroquine, HCW = healthcare worker, PPE = personal protective equipment, SOC = standard of care

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Limitations:

- Open-label
- Lack of detail around SOC
- Lack of primary outcome definition and determination
- Small sample sizes

Krolewiecki et al. pre-print. https://ssrn.com/abstract=3714649
Hashim HA, et al. pre-print. doi: https://doi.org/10.1101/2020.10.26.20219345
Chachar AZK, et al. *Int J Sci* 2020; 9: doi:10.18483/ijSci.2378
Elgazzar A, et al. pre-print. https://doi.org/10.21203/rs.3.rs-100956/v2

Update – RCTs, Placebo-Controlled

Study	Population	Intervention	Primary outcome	Results
Ahmed S, et al.	Hospitalized patients with mild COVID-19	IVM 12 mg daily x 5d (n=24) vs IVM 12 mg x 1d + doxycycline x 5d (n=24) vs Placebo (n=24)	Time to viral clearance, resolution of fever, and cough.	Time to viral clearance: IVM x 5d = 9.7d IVM + doxy = 11.5d Placebo = 12.7d No difference in resolution of fever or cough.
Niaee MS, et al. (pre-print)	Hospitalized patients with mild-severe COVID-19	All groups received HCQ as Iran's SOC. n =30 patients in each arm (180 total) S: SOC only P: SOC + placebo IVM 1: 200 mcg/kg x 1 IVM 2: 200 mcg/kg x 1 on d1,3,5 IVM 3: 400 mcg/kg x 1 IVM 4: 400 mcg/kg x 1 on d1, 200 mcg/kg d3,5	Clinical recovery within 45d	Reduced risk of death in IVM groups (3.3% vs 18.3%). The 400 mcg/kg single dose had the best composite of death, hospital duration, and duration of low oxygen saturations.
Chaccour C, et al.	Outpatients with mild COVID-19, no risk factors	IVM 400 mcg/kg x 1 (n=12) vs Placebo (n=12)	Detectable virus by PCR at d7	No difference in proportion of PCR+ patients at day 7. 100% in both groups had PCR+ for gene N. 91% IVM, 100% placebo had PCR+ for gene E.

IVM = ivermectin, d = day, HCQ = hydroxychloroquine, SOC = standard of care

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Limitations:

- Small sample sizes
- Soft primary outcomes (Ahmed & Chaccour)
- HCQ is not typical SOC

Ahmed S, et al. *IJID* 2021;103:214-216. https://doi.org/10.1016/j.ijid.2020.11.191
Niaee MS, et al. pre-print. https://doi.org/10.21203/rs.3.rs-109670/v1
Chaccour C, et al. *EClinicalMedicine* 2021;32. https://doi.org/10.21203/rs.3.rs-116547/v1

Update – RCTs, Placebo-Controlled

Study	Population	Intervention	Primary outcome	Results
Beltran Gonzalez JL, et al. (pre-print)	Hospitalized patients with evidence of COVID-19 pneumonia	Group 1 (n=33): HCQ 400 mg q12h x 1d, 200 mg q12h x 4d Group 2 (n=36): IVM 12 mg or 18 mg Group 3 (n=37): placebo	Duration of hospital stay	No difference in any of the outcomes including hospital duration or progression to respiratory failure or death
Lopez-Medina, et al.	Inpatients or outpatients with mild COVID-19	IVM 300 mcg/kg/day x 5 days (n=200) Placebo (n=198)	Time to resolution of symptoms	No difference in time to resolution of symptoms or in patients who were symptom free at 21 days • IVM 10 days (9-13), placebo 12 days (9-13); HR 1.07 (0.87 to 1.32) • Symptoms resolved at 21 days: 82% IVM, 79% placebo; 1.23 (0.75 to 2.01) Adverse events • 7.5% and 2.5% discontinued treatment due to AE • 4 patients (2 in each group) experience severe AE, but were not considered to be related to trial medication

IVM = ivermectin, d = day, HCQ = hydroxychloroquine, AE = adverse event

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Beltran Gonzalez JL, et al. pre-print. https://doi.org/10.1101/2021.02.18.21251037
Lopez-Medina, et al. *JAMA* 2021; doi:10.1001/jama.2021.3071

Ongoing Clinical Trials

52 trials registered on ClinicalTrials.gov (*ivermectin & SARS-CoV-2)*

- 24 actively recruiting

Status

Recruiting = 24
Completed = 18
Not yet recruiting = 9
Enrolling by invitation = 1

Country

Egypt = 8
Brazil = 4
Pakistan = 2
Argentina = 1
Colombia = 1
Mexico = 1
India = 1
Israel = 1
Japan = 1
Thailand = 1
USA = 1
Italy = 1

Indication

Treatment = 22
Prophylaxis = 2

Disease severity

Mild = 4
Mild-moderate = 7
Severe = 1
Any =
Asymptomatic = 1
Not infected = 2
Unknown = 9

Patient location

Outpatient = 10
Inpatient = 4
Both = 1
Unknown = 9

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www.clinicaltrials.gov

Safety

- Hypersensitivity reactions
- Large doses cross blood-brain barrier which can lead to depression, ataxia, psychosis, confusion, and seizure

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Guzzo CA, et al. *J Clin Pharmacol* 2002;42:1122-33.
Ivermectin [package insert]. Parsippany, NJ 07054: Edenbridge Pharmaceuticals;2012.

Adverse Drug Reactions

Standard dose:

- Pruritus
- Lymphadenitis
- Arthralgia
- Fever
- Tachycardia
- Diarrhea
- Nausea
- ALT, and/or AST elevation

10x standard dose:

- Headache
- Nausea
- Dizziness
- Rash

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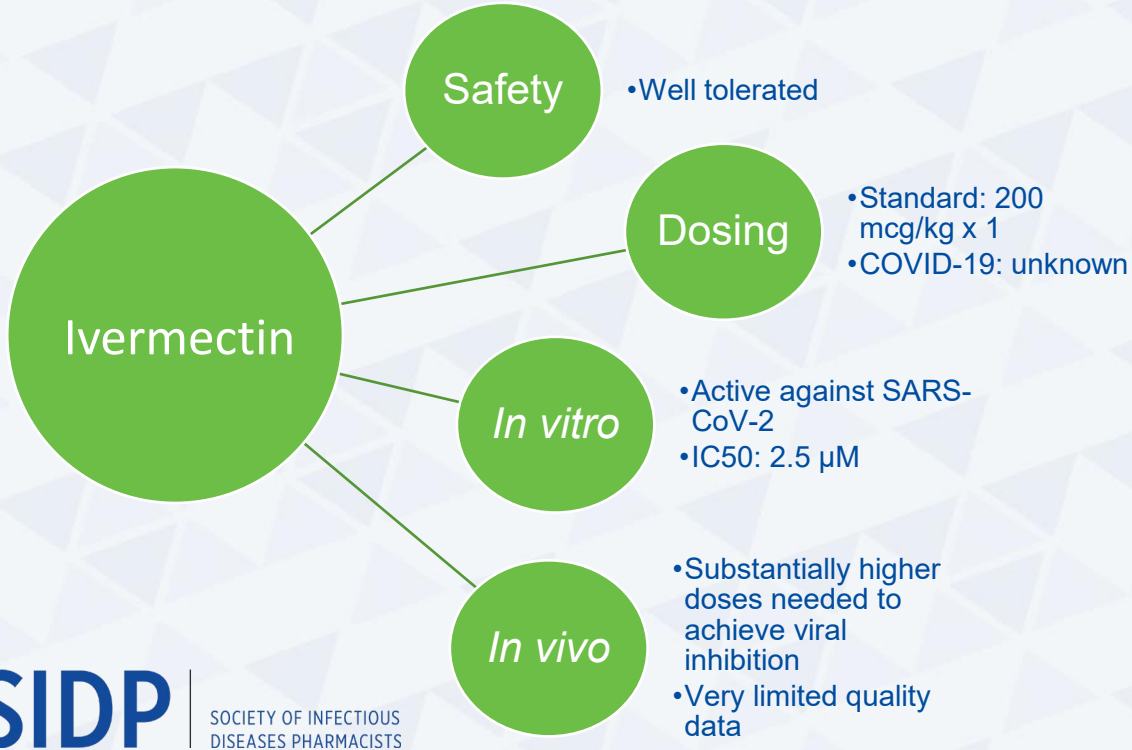
Guzzo CA, et al. *J Clin Pharmacol* 2002;42:1122-33.
Ivermectin [package insert]. Parsippany, NJ 07054: Edenbridge Pharmaceuticals;2012.

Clinical Pearls



- IDSA Guidelines recommend against the use of ivermectin.
- NIH Guidelines state insufficient data to recommend for or against the use of ivermectin.

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Bhimraj A, et al. https://www.idsociety.org/practice-guideline/covid-19-guideline-treatment-and-management/
https://www.covid19treatmentguidelines.nih.gov/antiviral-therapy/

Summary

There is a lack of high-quality evidence from well-designed and well-executed clinical trials to suggest ivermectin is a safe and effective therapy for prevention or treatment of COVID-19.

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Ivermectin

A Review of Pertinent Drug Information for SARS-CoV-2

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Data as of March 22, 2021