Schilddrüse und Sars COV2

Georg Zettinig

Vortrag Fokus Schilddrüse DGN, 24. 9. 2022 Würzburg

und

Vortrag Herbstfortbildung der Österreichischen Schilddrüsengesellschaft, 4. 11. 2022 Feldkirch

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Dieser Vortrag ist urheberrechtlich geschützt
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Verfassers verbreitet werden.

Sars Cov2

- Wechselwirkung mit verschiedenen Organen
- Beeinflusst Gerinnungssystem
- pulmonale und systemische Entzündungsreaktion

- Direkte Schädigung von Zellen
- Indirekte Schädigung durch immunvermittelte inflammatorische Reaktionen (Zytokine, Komplementsystem, Blutgerinnung involviert)

Spike Protein

- Bindet an ACE2 Rezeptor der Wirtszelle
- Transmembran-Protease Serin 2 (TMPRSS2) aktiviert die Bindung
- Expression beider Rezeptoren im SD Gewebe höher als in der Lunge

- Transmembran-Protease Serin 4 (TMPRSS4)
- Integrin (Expression wird durch T4 reguliert)
- olfaktorische Rezeptoren

- Obduktionsserie: In 9/25 Proben Virus im Schilddrüsengewebe

Poma AM et al (2022) COVID-19 autopsy cases:
Detection of virus in endocrine tissues. J Endocrinol Invest
45(1):209–214.
https://doi.org/10.1007/s40618-021-01628-y

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- Associated data

ARTICLE TYPE

- Books and Documents
- Clinical Trial
- Meta-Analysis
- Randomized Controlled Trial
- Review
- Systematic Review

PUBLICATION DATE

- 1 year
- 5 years
- 10 years

1 **Thyroid** disease i
Dworakowska D, Gro
Version 2. Endocrine.
PMID: 32507963
However, such gener
patients with sufferin
whether patients with
Cite Share

2 [A pathological re
Yao XH, Li TY, He ZC,
Guo QN, Chen C, Xia
Tang W, Pan PF, Huar
Zhonghua Bing Li Xue
10.3760/cma.j.cn1121
PMID: 32172546
Objective: To investig
coronavirus (2019-nC
COVID-19). Methods
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3 ENDOCRINOLOG
and cancer.
Vrachimis A, Iakovou

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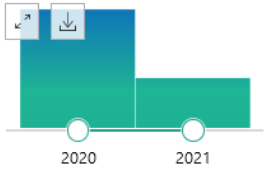

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ARTICLE ATTRIBUTE

- Associated data

ARTICLE TYPE

- Books and Documents
- Clinical Trial
- Meta-Analysis
- Randomized Controlled Trial

1 Following **SARS-CoV-2** in the first trim
the 2nd, 3rd trimesters, and postpartur
Sarahian N, Saei Ghare Naz M, Ramezani Tehra
Endocrine. 2021 Mar 15. doi: 10.1007/s12020-0
PMID: 33721205 No abstract available.
Cite Share

2 The association of TSH and **thyroid** ho
sepsis and **COVID-19**.
Grondman I, de Nooijer AH, Antonakos N, Jans
M, Smit JWA, van Herwaarden AE, Joosten LAB,
Netea MG, Giamarellos-Bourboulis EJ, Netea-N
J Clin Endocrinol Metab. 2021 Mar 13:dgab148
print.
PMID: 33713408
Remarkably, after one week follow-up, the majority (12/15) of **COVID-19** patients showed quantitative recovery of their lymphocyte numbers, while TSH and **thyroid** hormones remained mainly disturbed. CONCLUSION: Abnormal **thyroid** function correlates with ly ...
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3 Need for Testing and Supplementation of Vitamin D3 After Release of **COVID-19** Lockdown in Patients with Increased Musculoskeletal Pain.
Dhatt SS, Kumar V, Neradi D, Sodavarapu P, Meetei TT, Goni V.
Indian J Orthop. 2021 Mar 6:1-4. doi: 10.1007/s43465-021-00376-8. Online ahead of print.
PMID: 33716314 Free PMC article.
AIMS: To evaluate vitamin D3 levels in patients who presented with increased musculo-skeletal pain
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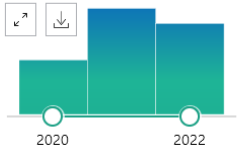

TEXT AVAILABILITY

- Abstract
- Free full text
- Full text

ARTICLE ATTRIBUTE

- Associated data

ARTICLE TYPE

- Books and Documents
- Clinical Trial
- Meta-Analysis
- Randomized Controlled

Use COVID-19 filters from PubMed Clinical Queries to refine your search
Treatment Mechanism Transmission More filters
See more SARS-CoV-2 literature, sequence, and clinical content from NCBI

1 **Thyroid** diseases are associated with coronavirus disease 2019 infection.
Tian Y, Zhao J, Wang T, Wang H, Yao J, Wang S, Mou Y.
Front Endocrinol (Lausanne). 2022 Sep 2;13:952049. doi: 10.3389/fendo.2022.952049. eCollection 2022.
PMID: 36120425 Free PMC article.
The proportion of patients with **thyroid** diseases in all **COVID-19** infection patients fluctuates between 0% and 88.46%. ...The pooled ORs with fixed-effects model are 3.72 (95% CI = 1.62-8.58, P = 0.002) and 5.86 (95% CI = 2.79-12.33, P < 0.00001), re
...
Cite Share

2 Newer onset of diabetes mellitus and **thyroid** dysfunction in **COVID-19**: Study from rural India.
Bawaskar HS, Bawaskar PH.
J Family Med Prim Care. 2022 Jun;11(6):3115-3117. doi: 10.4103/jfmpc.jfmpc_2232_21. Epub 2022 Jun 30.
PMID: 36119219 Free PMC article.
BACKGROUND: Cytokine and bardykine storm plays important role in then pathogenesis of **COVID-19** diseses, as result there are raised inflammatory markers and blood sugar. PATIENTS AND METHOD:
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Aspekte

- 1) Auswirkung einer Schilddrüsenerkrankung auf den Verlauf einer SARS Cov2 Infektion
- 2) Auswirkung einer SARS Cov2 Infektion auf die Schilddrüse
- 3) Auswirkung einer SARS Cov2 Impfung auf die Schilddrüse

Auswirkung einer Schilddrüsenerkrankung auf den Verlauf einer SARS Cov2 Infektion

- Bin ich Risikogruppe?

Bundesministerium
Soziales, Gesundheit, Pflege
und Konsumentenschutz

COVID-19-Impfungen: Priorisierung des Nationalen Impfgremiums

Version 3, Stand: 12.01.2021

Tabelle 2: Vorerkrankungen oder körperliche Gegebenheiten mi
Verlauf von COVID-19

Vorerkrankungen oder körperliche Gegebenheiten mit besonders hohem Risiko, sofern Impfung möglich/zugelassen	•	Vorerkrankungen oder körperliche Gegebenheiten mit erhöhtem Risiko sofern Impfung möglich/zugelassen und nicht in der Auflistung mit besonders hohem Risiko angeführt
	•	• Personen mit Betreuungsei
	•	• Personen mit einen schwer
		• Adipositas (BI
		• Chronische N
		• Chronische Le
		• Immundefizie
	•	• Diabetes Mel
		• Arrhythmie/V
		• HIV-Infektion
	•	• Koronare Her
		• Herzinsuffizie
		• Zerebrovasku
		• Autoimmune
	•	• Chronisch ob
		• Krebserkrank
		• Arterielle Hyp
		• Rheumatische
		• Asthma bron

Informationen zur Corona-Schu

https://impfservice.wien/corona-schutzimpfung/

Fragen zur Vormerkung

- Ich bin Lehrer, Pädagoge, arbeite in einer Bildungseinrichtung – Warum kann ich mich nicht vormerken? Warum ist meine Berufsgruppe nicht in der Vormerkliste?
- Ich gehöre zur systemkritischen Infrastruktur – Wie kann ich mich vormerken lassen?
- Ich gehöre zu eine Risikogruppe, aber auch zu einer Berufsgruppe? Was soll ich auswählen?
- Können Sie mir ungefähr sagen, wann ich mit der Impfung drankomme?
- Wenn ich mich auf die Warteliste setzen lasse, wie oft werde ich kontaktiert, wenn ich einmal nicht kann?
- **Ich habe eine Autoimmun-Erkrankung (zB Hashimoto) – zu welcher Gruppe gehöre ich?**

  Personen mit sonstigen schweren Erkrankungen gehören der Gruppe „Hochrisikopatienten“ und der Unterkategorie „sonstige schwere Erkrankungen mit funktionellen oder körperlichen Einschränkungen“ an.
- Ich habe das Formular für Corona Schutzimpfung per Email nicht erhalten, wie kann ich es erhalten?

Suchbegriff hier eingeben

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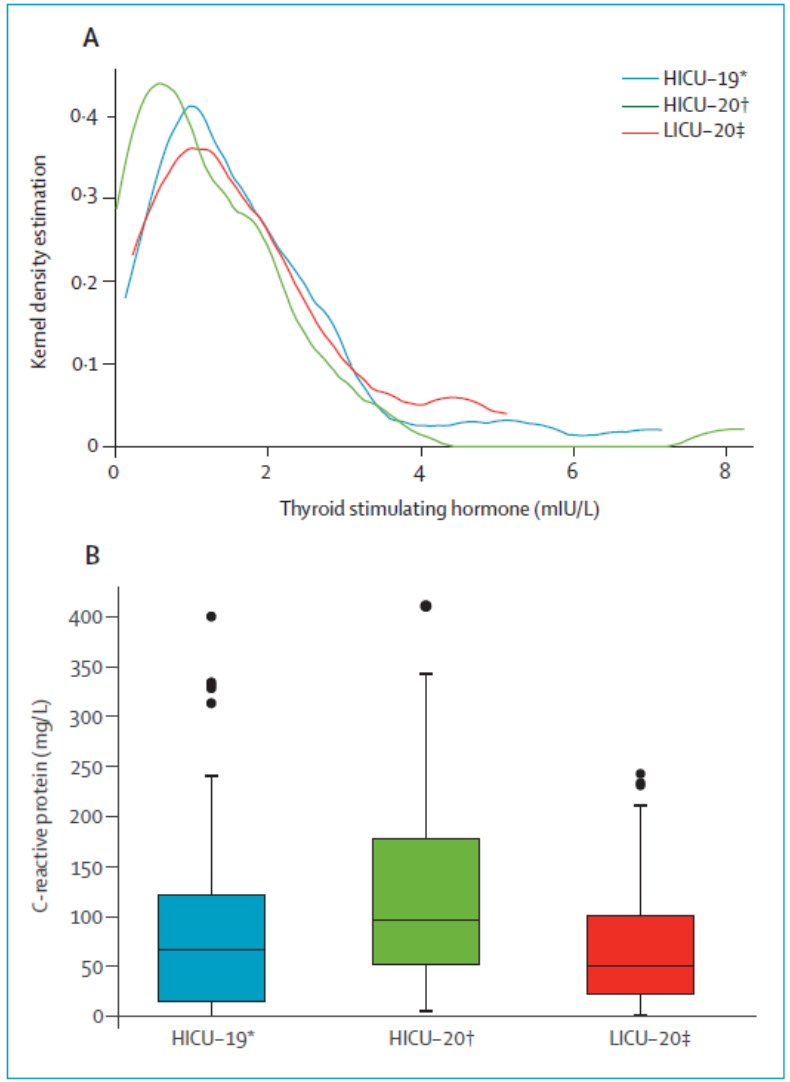
Covid Patienten auf der ICU

- Analyse von 93 High ICU 2020 und 105 HICU 2019 Patienten
- In HICU 2020 sogar weniger Patienten mit Autoimmnerkrankungen als 2019



Muller, Lancet Diabetes Endocrinol 2020

ORIGINAL RESEARCH ARTICLE
Front. Endocrinol., 18 August 2020 | https://doi.org/10.3389/fendo.2020.00565

Outcomes of Patients With Hypothyroidism and COVID-19: A Retrospective Cohort Study

Maaike van Gerwen[1,2*], Mathilda Alsen[1], Christine Little[1], Joshua Barlow[1], Leonard Naymagon[3], Douglas Tremblay[3], Catherine F. Sinclair[1*] and Eric Genden[1]

[1]Department of Otolaryngology- Head and Neck Surgery, Icahn School of Medicine at Mount Sinai, New York, NY, United States
[2]Institute for Translational Epidemiology, Icahn School of Medicine at Mount Sinai, New York, NY, United States
[3]Division of Hematology and Medical Oncology, Icahn School of Medicine at Mount Sinai, New York, NY, United States

- 3703 Covid positive New Yorker,
- 251 mit T4 Therapie einer Unterfunktion, (22 Hashimoto-Thyreoiditis)
- Kein erhöhtes Risiko für
  - Hospitalisierung,
  - mechanische Beatmung
  - Tod

https://www.ijidonline.com/article/S1201-9712(22)00016-9/fulltext

INTERNATIONAL JOURNAL OF INFECTIOUS DISEASES

INTERNATIONAL SOCIETY FOR INFECTIOUS DISEASES

FULL LENGTH ARTICLE | VOLUME 116, P319-327, MARCH 01, 2022

Hypothyroidism does not lead to worse prognosis in COVID-19: findings from the Brazilian COVID-19 registry

Daniella Nunes Pereira • Leticia Ferreira Gontijo Silveira, MD, PhD • Milena Maria Moreira Guimarães • ... Caroline Scherer Carvalho • Magda Carvalho Pires • Milena Soriano Marcolino • Show all authors

Open Access • Published: January 18, 2022 • DOI: https://doi.org/10.1016/j.ijid.2022.01.016 •

Check for updates

Highlights
Abstract
Keywords
Background
Methods
Discussion

Highlights

- This study analyzed 526 patients with COVID-19 with hypothyroidism and 526 controls.
- Patients with hypothyroidism required less intensive care interventions.
- Patients with hypothyroidism showed a trend of lower in-hospital mortality.
- Hypothyroidism does not seem to be associated with a worse prognosis in COVID-19.

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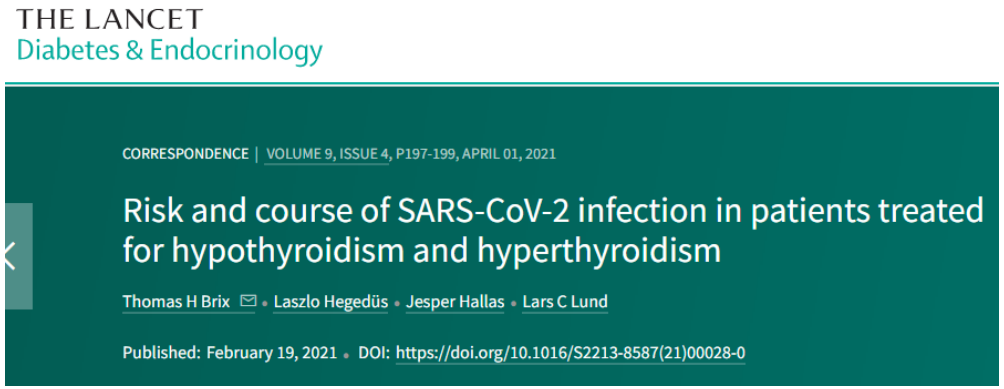
Zettinig 2022

Bestehende SD Erkrankung Risiko?

- Bacle et al. Endocrine 2021
  - 20/180 Covid-Patienten nahmen SD Hormon ein, was signifikant häufiger als in der Kontrollgruppe (23/360) war (11.1% versus 6.3%, p=0.01)
  - Autoimmunerkrankungen 65% vs. 61%
- Pappa et al. Endocrine 2021
  - Mortalität bei 170 Covid-Patienten mit T4 6.5%, ohne T4 20.9%, p=0.06

Brix et al. Lancet Diab Endocrinol 2021

- Aufarbeitung des dänischen Registers


THE LANCET
Diabetes & Endocrinology

CORRESPONDENCE | VOLUME 9, ISSUE 4, P197-199, APRIL 01, 2021

Risk and course of SARS-CoV-2 infection in patients treated for hypothyroidism and hyperthyroidism

Thomas H Brix • Laszlo Hegedüs • Jesper Hallas • Lars C Lund

Published: February 19, 2021 • DOI: https://doi.org/10.1016/S2213-8587(21)00028-0

- We suggest that patients treated for hypothyroidism or hyperthyroidism do not have an increased risk of contracting SARS-CoV-2 infection.
- The results also suggest that treatment for thyroid dysfunction, when controlling for relevant confounding, does not influence the prognosis of SARS-CoV-2 infection.

Auswirkung einer SARS Cov2 Infektion auf die Schilddrüse

- Veränderte Schilddrüsenwerte bei schwerkranken Covid 19 Patienten

- Thyreoiditis
- Autoimmunerkrankung

Auswirkung einer SARS Cov2 Infektion auf die Schilddrüse

- Veränderte Schilddrüsenwerte bei schwerkranken Covid 19 Patienten

- Thyreoiditis
- Autoimmunerkrankung

ELSEVIER
Molecular and Cellular Endocrinology
journal homepage: www.elsevier.com/locate/mce

Thyroid fuction test within three days of admission
Exclusion: known endocrine disorder, thyroid surgery

Thyroid dysfunction may be associated with poor outcomes in patients with COVID-19

Yan Zhang [a,1], Fer
Omair Ahmed [d], Ji
Yifei Fan [a], Yanjun
medical team fron

[a] Department of Respiratory Me
[b] Division of Allergy and Clinic
[c] Department of Respiratory Me
[d] Ziauddin University, Clifton, I
[e] Department of Gastrointestina
[f] Department of Radiology, Xia
[g] Department of Dermatology, X
[h] Department of Social Medicin

Table 3
Disease severity, treatment, and prognosis of COVID-19 patients.

Variable	Total (N = 71)	With TD (n = 25)	Without TD (n = 46)	*P*
Severity, n (%)				
Mild to moderate	4 (5.6)	1 (4.0)	3 (6.5)	<0.001
Severe	50 (70.4)	10 (40.0)	40 (87.0)	
Critical	17 (23.9)	14 (56.0)	3 (6.5)	
Complications, n (%)				
Acute respiratory distress				<0.001
Acute cardiac injury				0.028
Acute kidney injury				0.035
Medication, n (%)				
Antiviral agent				0.460
Antibiotic				0.031
Corticosteroid				0.007
Oxygen support, n (%)				
Nasal cannula				0.228
High-flow oxygen				<0.001
Non-invasive ventilation				0.001
Invasive ventilation				0.002
Prognosis, n (%)				
Hospital stay≥28 days				0.048
Death				0.002

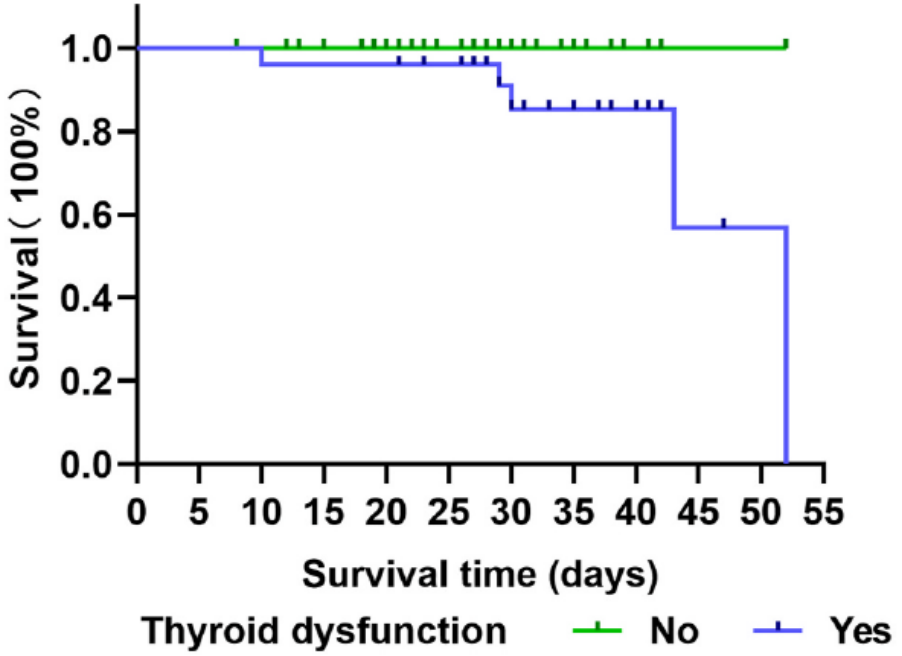


Fig. 2. Kaplan-Meier Curve for mortality in COVID-19 patients with thyroid dysfunction (TD) or those without TD.

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Zettinig 2022

Chen et al, Thyroid Function Analysis in 50 Patients with COVID-19: A Retrospective Study. Thyroid 2021, Hangzhou

TABLE 2. COMPARISON OF SERUM TSH, TT3, AND TT4 AMONG DIFFERENT CLINICAL CLASSIFICATION OF COVID-19 ACCORDING TO SEVERITY

	TSH (mIU/L)	*TT3 (nmol/L)*	*TT4 (nmol/L)*
Control ($n=54$)	1.57 [1.03, 1.97]	1.58 [1.49, 1.73]	97.11 [85.73, 108.76]
Moderate ($n=15$)	0.50 [0.22, 1.58]	1.33 [1.02, 1.53]	98.67 [85.59, 112.63]
Severe ($n=23$)	0.286 [0.13, 0.77]	0.95 [0.88, 1.12]	100.98 [72.73, 114.27]
Critical ($n=12$)	0.23 [0.085, 0.42]	0.83 [0.68, 0.96]	85.05 [78.33, 118.70]
p-value*	<0.001	<0.001	0.756
p-trend#	<0.001	<0.001	—

Moderate: moderate COVID-19; severe: severe COVID-19; critical: critical COVID-19; The median [first quarter, third quarter] of continuous variables was used.

*The p-value means that there is difference as compared among all the groups.

#p-trend means that there is a trend for the more severe the COVID-19, the lower the TSH and TT3 levels were.

Khoo et al, JCEM 2020, London:

- Vergleich hospitalisierte Patienten (334 Covid, 122 kein Covid, Schilddrüsenerkrankungen ausgeschlossen)
- Euthyreose bei 86% der Covid positiven Patienten
- Bei Covid pos. milde Reduktion von TSH und fT4
- Im Follow Up bei Überlebenden Normalisierung von fT4 und fT3

Lui et al, JCEM 2021, Hong Kong

- Milder/moderater Covid Verlauf
- 191 Covid pos.
- 10/191 niedriges TSH
- Niedrigere Ct Werte in PCR assoziiert mit niedrigem TSH
- Low T3 assoziiert mit systemischer Inflammation/Fieber
- Niedriges T3 scheint mit schlechterer Prognose assoziiert zu sein

Chen et. al. 2022, Front Endocrinol

- Metaanalyse
- Bei schwerem COVID-19-Verlauf Inzidenz abnormer Schilddrüsenblutwerte höher
- Serumspiegel von fT4 (nicht signifikant) und fT3 (signifikant) niedriger
- Bei an COVID-19 Verstorbenen versus Überlebenden ähnlich.
- Niedrige fT3- und fT4-Werte sowie niedrige TSH-Werte während des stationären Aufenthalts mit erhöhten Mortalität assoziiert
- Umgekehrt fT3 und auch fT4 und TSH umso niedriger, je schwerer der Verlauf der COVID-19-Erkrankung ist

Auswirkung einer SARS Cov2 Infektion auf die Schilddrüse

- Veränderte Schilddrüsenwerte bei schwerkranken Covid 19 Patienten

- Thyreoiditis
- Autoimmunerkrankung

Direkte Zellschädigung
Immunmodulation

CLINICAL RESEARCH ARTICLE

Subacute Thyroiditis After Sars-COV-2 Infection

Alessandro Brancatella,[1] Debora Ricci,[1] Nicola Viola,[1] Daniele Sgrò,[1] Ferruccio Santini,[1] and Francesco Latrofa[1]

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56127, Italy

ORCiD numbers: 0000-0002-5615-6325 (A. Brancatella); 0000-0003-0297-5904

Clinical Research Article

Is Subacute Thyroiditis an Underestimat Manifestation of SARS-CoV-2 Infection? From a Case Series

Alessandro Brancatella [1] Debora Ricci [1] Daniele Cappellani [1]
Daniele Sgr

[1]Endocrinology U
Pisa 56124, Italy

ORCiD numbers: 00

Abbreviations: COV
SAT, subacute thyro

Received: 8 July 202
2020.

New disease

Case report

Subacute thyroiditis associated with COVID-19

Shaikh Abdul Matin Mattar ,[1] Samuel Ji Quan Koh,[1] Suresh Rama Chandran,[2] Benjamin Pei Zhi Cherng[3]

[1]Department of Internal Medicine, Singapore General Hospital, Singapore

SUMMARY
We report a case of a hospitalised patient with COVID-19 who developed subacute thyroiditis in
infection. The patient
nterior neck pain and
a hyperthyroidism together
using Roche Cobas SARS-CoV-2 test. The test for SARS-CoV-2 was positive. Initial laboratory tests on admission to the hospital showed a normal white cell count (9.8×10^9/L), haemoglobin level (14.3 g/dL) and platelet count (444 000/mm^3). C reactive protein (CRP) level was mildly elevated at
ydrogenase (LDH) was
3 units/L. A chest X-ray

Hormones
https://doi.org/10.1007/s42000-020-00230-w

LETTER TO THE EDITOR

Subacute thyroiditis in a patient infected with SARS-COV-2: an endocrine complication linked to the COVID-19 pandemic

Rosaria Maddalena Ruggeri[1] · Alfredo Campennì[2] · Massimiliano Siracusa[2] · Giuseppe Frazzetto[3] · Damiano

Received: 19 June 2020 / Accepted: 3 July 2020
© Hellenic Endocrine Society 2020

European Thyroid Journal

Clinical Thyroidology / Brief Report

Eur Thyroid J 2020;9:321–323
DOI: 10.1159/000511707

Received: June 27, 2020
Accepted: September 16, 2020
Published online: October 30, 2020

Subacute Thyroiditis in COVID-19 Patients

Saeed Sohrabpour Farrokh Heidari Ebrahim Karimi Reza Ansari Ardavan Tajdini Firouzeh Heidari

Otorhinolaryngology Research Center, Amir-Alam Hospital, Tehran University of Medical Sciences, Tehran, Iran

BMJ Case Rep: first published as 10.1136/bcr-2020-

THE LANCET
Diabetes & Endocrinology

CORRESPONDENCE | VOLUME 8, ISSUE 9, P739-741, SEPTEMBER 01, 2020

SARS-CoV-2-related atypical thyroiditis

Ilaria Muller • Daniele Cannavaro • Davide Dazzi • Danila Covelli • Giovanna Mantovani • Antonio Muscatello • et al. Show all authors

Published: July 30, 2020 • DOI: https://doi.org/10.1016/S2213-8587(20)30266-7

Supplementary Material

References

Article Info

Figures

Related Specialty

The COVID-19 pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)[1, 2] has seriously affected northern Italy. Preliminary data analysis of patients with COVID-19 who required high intensity of care at our institution (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan, Italy) showed that these individuals commonly had low or suppressed serum thyroid stimulating hormone, with and without elevated free thyroxine concentrations, which suggests thyrotoxicosis. Patients who are critically ill can have alterations of thyroid function tests, known as non-thyroidal illness syndrome.[3, 4] Alternatively, thyrotoxicosis could result from SARS-CoV-2 directly infecting the thyroid gland, as described in other viral infections. Infection of the thyroid gland is known as subacute thyroiditis and is characterised by self-limiting thyrotoxicosis of variable duration—lasting a period of weeks or months—followed by hypothyroidism with final restoration of euthyroidism.[5, 6]

Muller, Lancet Diabetes Endocrinol 2020

- Detaillierte Analyse von 8 Patienten mit abnormen Schilddrüsenwerten
  - n=2: chron. Immunthyreoiditis
  - n=6: typisches Muster einer fokalen Thyreoiditis in US und Szinti, passagere Hyperthyreose, Normalisierung, keine Antikörper
- Kein Schmerz in der Schilddrüsenloge

Received: 11 January 2021 | Revised: 24 February 2021 | Accepted: 25 February 2021

DOI: 10.1111/cen.14453

REVIEW ARTICLE

WILEY

COVID-19-related thyroiditis: A novel disease entity?

Dorota Dworakowska[1,2,3] | Simon Morley[4] | Nicola Mulholland[5,6] | Ashley B Grossman[7,8]

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[2]Guy's Richard Dimbleby Department of Cancer Research, Kings College London, London, UK

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[8]OCDEM, University of Oxford, Oxford, UK

Correspondence
Dorota Dworakowska, Guy's Richard Dimbleby Department of Cancer Research, Kings College London, London, UK.

Abstract

The literature on COVID-19-related thyroid complications has accumulated over the past year or so as the pandemic has accelerated throughout the world. In particular, several recent case reports have been published describing a possible correlation between COVID-19 disease and subacute thyroiditis (SAT). In this review, we briefly present one of our own patients and review the current published literature in this area up to January 2021, including analyses of major series of thyroid function tests in patients with significant COVID-19 infection. We conclude that while the great majority of patients with severe COVID-19 infection may show manifestations of the sick euthyroid syndrome, clinicians should be aware of the possibility of SAT, especially in the early weeks and months following even mild COVID-19 infection.

KEYWORDS
COVID-19, Thyroiditis, Thyrotoxicosis, Viral thyroiditis

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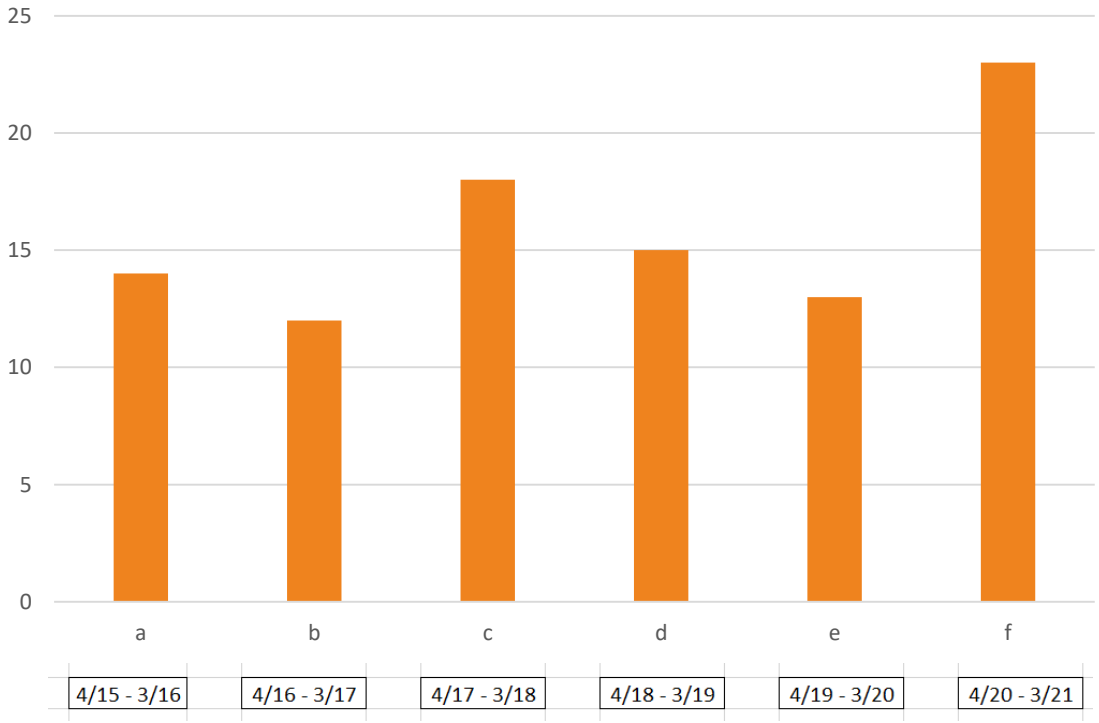
Subakute Thyreoiditis, Erstvorstellung
Schilddrüsenpraxis Josefstadt



Endocrine
https://doi.org/10.1007/s12020-022-03197-3

ORIGINAL ARTICLE

Impact of the COVID-19 pandemic on the incidence, seasonal distribution, and characteristics of subacute thyroiditis

Hayri Bostan[1] · Muhammed Erkam Sencar[1,2] · Murat Calapkulu[1] · Serdar Kayihan[1] · Sema Hepsen[1] · Aykut Cimsir[1] · Umran Gul[1] · Ilknur Ozturk Unsal[1] · Ozgur Ozcelik[1] · Muhammed Kizilgul[1] · Bekir Ucan[1] · Erman Cakal[1]

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Abstract
Purpose An increasing number of cases of subacute thyroiditis (SAT) related to the coronavirus disease 2019 (COVID-19) and its vaccines continue to be published. The aim of this study was to investigate any change in the incidence and characteristics of SAT by comparing the pre-pandemic and pandemic periods.
Methods This retrospective, single-center study included 432 newly-diagnosed SAT patients between January 2018 and

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› Aktuelle Ausgabe

Horm Metab Res 2022; 54(08): 556-561
DOI: 10.1055/a-1804-9561

PDF herunterladen

Original Article: Endocrine Care

Subacute Thyroiditis Following SARS-CoV-2 Vaccines: Six Cases Report and Review of the Literature

Neslihan Kurtulmus , Kubra Kayikci

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Abstract | Volltext | Referenzen

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Abstract

Subacute thyroiditis (SAT
develops following viral
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Journal of Endocrinological Investigation (2022) 45:1341–1347
https://doi.org/10.1007/s40618-022-01767-w

ORIGINAL ARTICLE

SARS-CoV-2 vaccine-associated subacute thyroiditis

G. Yorulmaz[1] · M. Sahin Tekin[2]

Received: 17 November 2021 / Accepted: 9 February 2022 / Published online: 19 February 2022
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Abstract
Purpose With coronavirus disease 2019 (COVID-19), subacute thyroiditis (SAT) cas
COVID-19 vaccine-associated SAT cases have also been reported. In this article, we pres
SAT cases.

Journal of Endocrinological Investigation (2022) 45:1189–1200
https://doi.org/10.1007/s40618-022-01747-0

ORIGINAL ARTICLE

Check for updates

SARS-CoV-2 vaccine-associated subacute thyroiditis: insights from a systematic review

S. Ippolito[1] · D. Gallo[1] · A. Rossini[2] · B. Patera[3] · N. Lanzo[3] · G. F. M. Fazzino[3] · E. Piantanida[1,3] · M. L. Tanda[1,3]

Received: 4 January 2022 / Accepted: 13 January 2022 / Published online: 29 January 2022
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Abstract
Purpose To perform a systematic review on published cases of subacute thyroiditis (SAT) secondary to SARS-CoV-2 vaccination, to highlight main features and increase the awareness of this condition.
Methods Original reports of SAT developed after SARS-CoV-2 vaccination (mRNA, viral vector, or inactivated virus vaccines) were retrieved from a search of electronic databases. Individual patient data on demographics, medical history, type of vaccine, workup and therapies were collected. Wilcoxon rank-sum, Kruskal–Wallis and chi-squared tests were employed for comparisons.
Results 30 articles including 48 reports were retrieved, 3 additional cases evaluated by the Authors were described and

SARS-CoV-2 Vaccine–induced Thyroiditis: Safety of Revaccinations and Clinical Follow-up

Seda Hanife Oğuz,[1] Süleyman Nahit Şendur,[1] Burçin Gönül İremli,[1] Alper Gürlek,[1] Tomris Erbas,[1] and Uğur Ünlütürk[1]

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Abstract

Context: The number of reported cases with severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) vaccine–induced subacute thyroiditis (SAT) and Graves' disease (GD) is growing. However, active debate continues about managing such side effects and the safety of repeat or booster doses of the vaccines in such cases.

Objectives: This study aims to present long-term clinical follow-up of SARS-CoV-2 vaccine–induced SAT or GD cases and provide data regarding the safety of revaccinations.

Methods: Patients diagnosed with SARS-CoV-2 vaccine–induced SAT or GD were included. Data regarding the long-term clinical follow-up of SARS-CoV-2 vaccine–induced SAT and GD cases and outcomes of repeat or booster SARS-CoV-2 vaccinations were documented. The literature, including cases of SARS-CoV-2 vaccine–induced SAT or GD, was reviewed.

Results: Fifteen patients with SARS-CoV-2 vaccine–induced SAT and 4 with GD were included. Pfizer/BioNTech COVID-19 vaccine (BNT162b2) was associated with symptoms in a majority of cases with SAT and all with GD. Median time from vaccination to symptom onset was 7 and 11.5 days, respectively, while 7 and 2 patients required medical treatment in SAT and GD groups, respectively. Remission was documented in 10 SAT patients, with a median time to remission of 11.5 weeks. No exacerbation/recurrence of SAT occurred in 7 of 9 patients who received a repeat vaccination dose, while symptoms of SAT worsened following the second vaccination in 2 cases. None of the patients experienced severe side effects that could be associated with revaccinations.

Conclusions: Revaccinations appear to be safe in patients with SARS-CoV-2 vaccine–induced SAT cases, while more evidence is needed regarding SARS-CoV-2 vaccine–induced GD.

Key Words: subacute thyroiditis, Graves' disease, SARS-CoV-2, COVID-19, vaccine, revaccination

diagnostics

MDPI

Review

The New Entity of Subacute Thyroiditis amid the COVID-19 Pandemic: From Infection to Vaccine

Mihaela Popescu [1,†], Adina Ghemigian [2,3], Corina Maria Vasile [4], Andrei Costache [5], Mara Carsote [2,3,*] and Alice Elena Ghenea [6,†]

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3 Department of Endocrinology, C.I. Parhon National Institute of Endocrinology, 011863 Bucharest, Romania

Mb. Basedow nach Covid 19

- SARSCOV-2 as a trigger for autoimmune disease: report of two cases of Graves' disease after COVID-19. Mateu-Salat M (2020) J Endocrinol Invest 43(10):1527–1528.
- COVID-19-induced graves' disease. Ghareebian H (2022) Cureus 14(2):e22260.
- Graves'thyrotoxicosis following SARS-CoV-2 infection. Harris A (2021) AACE Clin Case Rep 714–16.
- Recurrent Graves' disease post SARS-CoV-2 infection. Montebello A (2021) BMJ Case Rep 14(8):e244714.
- SARS-CoV-2 plays a pivotal role in inducing hyperthyroidism of Graves'disease. Murugan AK (2021) Endocrine 73(2):243–254.
- Graves' disease and Graves' orbitopathy following COVID-19. Lanzolla G (2021) J Endocrinol Invest 44(9):2011–2012.

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DOI: 10.1089/thy.2021.0142

Two Cases of Graves' Disease Following SARS-CoV-2 Vaccination: An Autoimmune/Inflammatory Syndrome Induced by Adjuvants

Olga Vera-Lastra,[1,2] Alberto Ordinola Navarro,[1,*] Maria Pilar Cruz Domiguez,[2,3] Gabriela Medina,[2,4] Tania Ivonne Sánchez Valadez,[5] and Luis J. Jara[2,6]

Background: The autoimmune/inflammatory syndrome induced by adjuvants (ASIA) comprises four entities, including the postvaccination phenomenon, which appears after being exposed to adjuvants in vaccines that increase the immune response. There is limited information about autoimmune endocrine diseases and ASIA after severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccination.
Patient's Findings: Two female health care workers received a SARS-CoV-2 vaccine, and three days later developed clinical manifestations of thyroid hyperactivity, with increased thyroid hormone levels on thyroid

Journal of Endocrinological Investigation
https://doi.org/10.1007/s40618-021-01650-0

LETTER

Two further cases of Graves' disease following SARS-Cov-2 vaccination

G. Zettinig[1] · M. Krebs[2]

Received: 20 July 2021 / Accepted: 22 July 2021
© Italian Society of Endocrinology (SIE) 2021

Keywords SARS-Cov-2 RNA vaccination · Graves' disease · COVID · Thyroid

Dear Editor,

Recently, two cases of Graves' disease after SARS-Cov2 RNA vaccination with tozinameran have been reported [1]. Here, we report two further cases: a late recurrence after 17 years and an initial manifestation.

A 71-year-old lady had subtotal resection of the left lobe. Soon thereafter, Graves' disease occurred, treated by thyreostatic drugs until 2004. She has been in care of our Thyroid Center since 2008. She was euthyroid with normal

Patient 2 is a 46-year-old male without previous history of thyroid disease. Since the age of 43, regular blood tests documented euthyroidism. He had his first vaccination with tozinameran on 6. May. A routine blood test on 21. May noticed hyperthyroidism. At his first visit at our Thyroid Center on 1. June, he had a free T4 of 1.63, a free T3 of 5.18 pg/ml, and a TRAB level of 2.9 IU/l. Sonography showed a slightly enlarged thyroid. In the hypoechogenic parenchyma, large anechogenic areas with increased vascularization were seen. Scintigraphy also showed a patchy,

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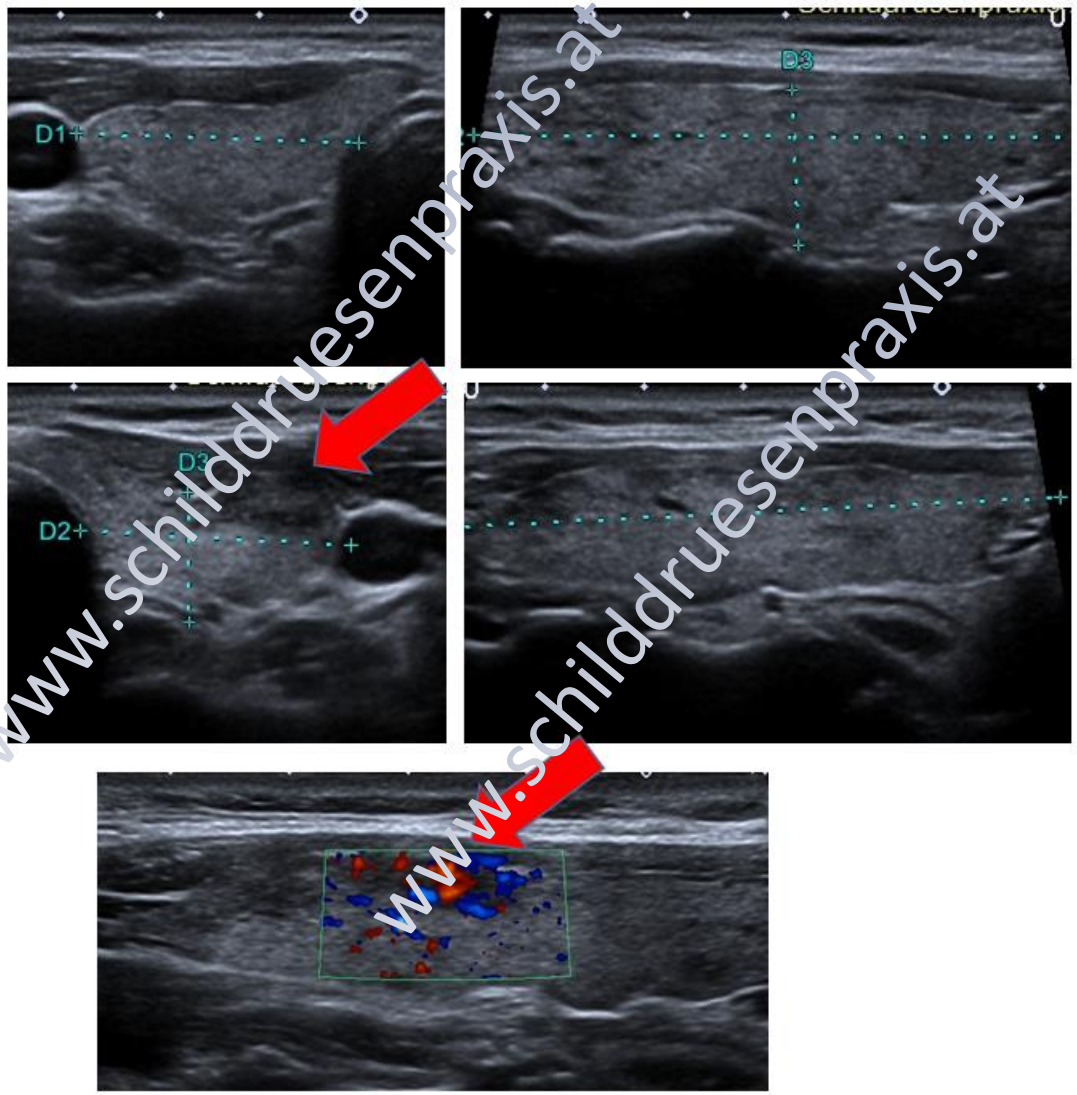

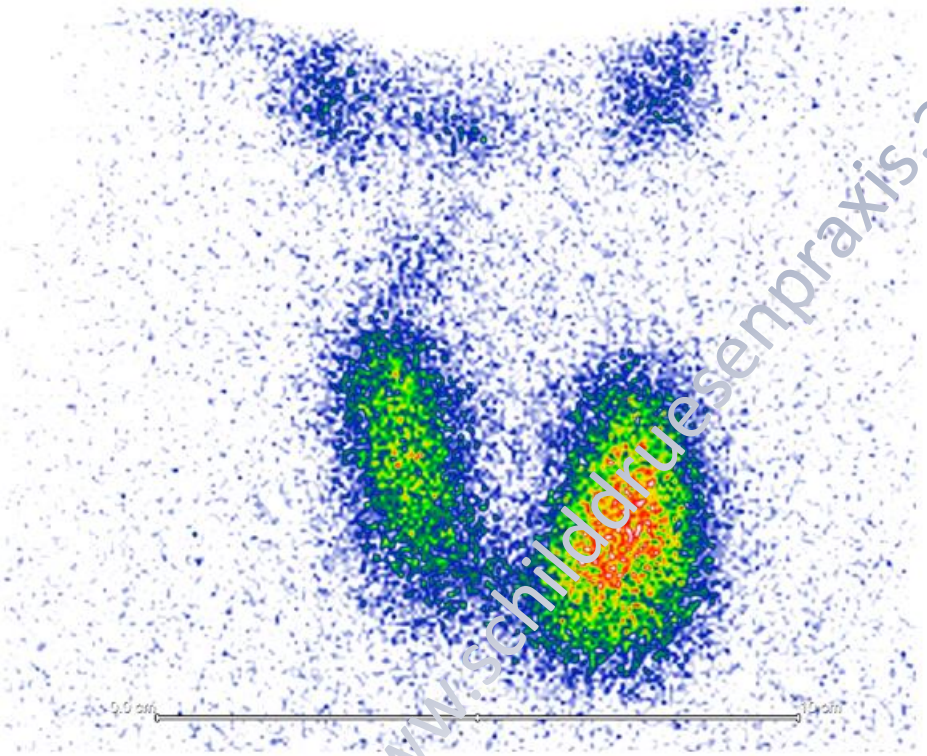

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Zahlreiche weitere Berichte

- Development of graves' disease after SARS-CoV-2 mRNA vaccination: a case report and literature review. Lui DTW (2021) Front Public Health 9:778964.
- Relapsed and newly diagnosed Graves' disease due to immunization against COVID-19: A case series and review of the literature. BostanH (2022) J Autoimmun 128:102809.
- Graves disease following the SARS-CoV-2 vaccine: case series. Weintraub MA (2021) J Investig Med High Impact Case Rep.
- Graves' disease following administration of second dose of SARS-CoV-2 vaccine. Goblirsch TJ (2021) BMJ Case Rep14(12):e246432.
- SARS-CoV-2 mRNA vaccination and graves' disease: a report of 12 cases and review of the literature. Chee YJ (2022) J Clin Endocrinol Metab 107(6):e2324–e2330.

Endokrine Orbitopathie

- St. p. RJ vor 12 a bei Mb. Basedow
- Jahrelanger stabiler Verlauf
- 2 Monate nach Impfung E.O.

Thyroid Eye Disease Following COVID-19 Vaccine in a Patient With a History Graves' Disease: A Case Report

Tal J. Rubinstein, MD†‡*

Abstract: **A 50-year-old woman with a history of controlled Graves' disease without clinical ophthalmopathy presents with 2 months of left more than right periorbital swelling and proptosis. Her eye symptoms and signs began 3 days following her second vaccination against the COVID-19 virus. Orbital imaging, elevated thyroid stimulating immunoglobulin, and negative systemic work up for other diseases were consistent with a diagnosis of active thyroid eye disease. The temporal relationship to her vaccination was likely consistent with autoimmune/inflammatory syndrome associated with adjuvants. Clinicians should remind patients of the symptoms and signs of thyroid eye disease and to seek appropriate medical and ophthalmic advice if they occur after the COVID-19 vaccine.**

Thyroid eye disease (TED) is an orbital and periorbital manifestation of Graves' disease, an autoimmune thyroiditis. The

Diabetes mellitus

- Vitiligo, 8 Jahre DM II
- bildet nach Impfung einen DM I und Mb. Basedow aus

ELSEVIER

Journal of Autoimmunity
Volume 125, December 2021, 102738

A case of Graves' disease and type 1 diabetes mellitus following SARS-CoV-2 vaccination

Armando Patrizio [a], Silvia Martina Ferrari [b], Alessandro Antonelli [c], Poupak Fallahi [d]

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Highlights

- SARS-CoV-2 vaccination could trigger autoimmune endocrine disease.
- Fifth case of Graves' disease following SARS-CoV-2 vaccination.
- First description of type 1 diabetes following SARS-CoV-2 vaccination.
- ASIA syndrome and molecular mimicry are potential mechanisms.

JCEM THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM

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Article Contents

Abstract

JOURNAL ARTICLE ACCEPTED MANUSCRIPT

Distinct clinical features of post COVID-19 vaccination early-onset Graves' disease (PoVEO GD)

Luigi di Filippo, Laura Castellino, Agnese Allora, Stefano Frara, Roberto Lanzi, Francesca Perticone, Fanny Valsecchi, Alberto Vassallo, Raffaele Giubbini, Clifford J Rosen ... Show more

The Journal of Clinical Endocrinology & Metabolism, dgac550, https://doi.org/10.1210/clinem/dgac550

Published: 21 September 2022 **Article history** ▾

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Abstract

Context

Several case reports of Graves' disease (GD) occurrence after COVID-19

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- Wiener Großlabor
  - Bei TRAK Anforderung TRAK positiv – jeder Patient pro Jahr nur einmal
  - 2019: 3.92%
  - 2020: 4.06%
  - 2021: 3.41%
- Thiamazol Verschreibungen bei Rezeptgebühr-Befreiten
- Laufende Studie der eigenen Patienten

THYROID
Volume 00, Number 00, 2021
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DOI: 10.1089/thy.2021.0142

Two Cases of Graves' Disease Following SARS-CoV-2 Vaccination: An Autoimmune/Inflammatory Syndrome Induced by Adjuvants

Olga Vera-Lastra,[1,2] Alberto Ordinola Navarro,[1,*] Maria Pilar Cruz Domiguez,[2,3] Gabriela Medina,[2,4] Tania Ivonne Sánchez Valadez,[5] and Luis J. Jara[2,6]

Background: The autoimmune/inflammatory syndrome induced by adjuvants (ASIA) comprises four entities, including the postvaccination phenomenon, which appears after being exposed to adjuvants in vaccines that increase the immune response. There is limited information about autoimmune endocrine diseases and ASIA after severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccination.
Patient's Findings: Two female health care workers received a SARS-CoV-2 vaccine, and three days later developed clinical manifestations of thyroid hyperactivity, with increased thyroid hormone levels on thyroid

The Journal of Clinical Endocrinology & Metabolism, 2021, Vol. 106, No. 9, 2600–2605
doi:10.1210/clinem/dgab373
Clinical Research Article

Clinical Research Article

Three Cases of Subacute Thyroiditis Following SARS-CoV-2 Vaccine: Postvaccination ASIA Syndrome

Burçin Gönül İremli,[1] Süleyman Nahit Şendur,[1] and Uğur Ünlütürk[1]

[1]Division of Endocrinology and Metabolism, Department of Internal Medicine, Hacettepe University School of Medicine, Hacettepe, Ankara, Turkey

ORCiD number: 0000-0002-5054-1396 (U. Ünlütürk).

Received: 24 April 2021; Editorial Decision: 21 May 2021; First Published Online: 27 May 2021; Corrected and Typeset: 24 June 2021.

Abstract

Context: Autoimmune/inflammatory syndrome induced by adjuvants (ASIA syndrome) can be seen as a postvaccination phenomenon that occurs after exposure to adjuvants in vaccines that increase the immune responses. There are very limited data regarding ASIA syndrome following severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccines.

Objectives: This work aims to report cases of subacute thyroiditis related to the SARS-CoV-2 vaccine.

Methods: We describe the clinical, laboratory, and imaging features of 3 cases of

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TYPE Case Report
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SPECIALTY SECTION
This article was submitted to Translational Medicine, a section of the journal Frontiers in Medicine

RECEIVED 18 January 2022

Case report: subacute thyroiditis after receiving SARS-CoV-2 vaccine, maybe not only adjuvants

Yizhou Huang, Xingyu Chen, Qing Wang, Xiaowei Lei and Lili Zhang *

Department of Endocrinology, The Second Affiliated Hospital, Chongqing Medical University, Chongqing, China

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) induced the new coronavirus disease 2019 (COVID-19) pandemic worldwide. SARS-CoV-2 vaccines are designed to control the transmission of the disease. However, post-vaccination subacute thyroiditis (SAT) also appears with increase vaccination rate. Three cases of SAT after SARS-CoV-2 vaccines are described

Induktion einer Schilddrüsenerkrankung nach Impfung - Konzepte

- ASIA Syndrom
  - Autoimmune / Inflammatory Syndrome Induced by Adjuvans

- Spike Protein triggert Autoimmunität
  - Molekulares Mimikri
  - Kreuzreaktion des viralen Protein S in der Impfung mit TPO
  - Ähnlichkeit der Gensequenzen 50-70%

- Direkte Zellschädigung

Wong et al. BMC Medicine (2022) 20:339
https://doi.org/10.1186/s12916-022-02548-1

BMC Medicine

RESEARCH ARTICLE Open Access

Risk of thyroid dysfunction associated with mRNA and inactivated COVID-19 vaccines: a population-based study of 2.3 million vaccine recipients

Carlos King Ho Wong[1,2,3†], David Tak Wai Lui[4†], Xi Xiong[1†], Celine Sze Ling Chui[3,5,6], Francisco Tsz Tsun Lai[1,3], Xue Li[1,3,4], Eric Yuk Fai Wan[1,2,3], Ching Lung Cheung[1,3], Chi Ho Lee[4], Yu Cho Woo[4], Ivan Chi Ho Au[1], Matthew Shing Hin Chung[1], Franco Wing Tak Cheng[1], Kathryn Choon Beng Tan[4] and Ian Chi Kei Wong[1,3,7,8*]

Abstract

Background: In view of accumulating case reports of thyroid dysfunction following COVID-19 vaccination, we evaluated the risks of incident thyroid dysfunction following inactivated (CoronaVac) and mRNA (BNT162b2) COVID-19 vaccines using a population-based dataset.

Methods: We identified people who received COVID-19 vaccination between 23 February and 30 September 2021 from a population-based electronic health database in Hong Kong, linked to vaccination records. Thyroid dysfunction encompassed anti-thyroid drug (ATD)/levothyroxine (LT4) initiation, biochemical picture of hyperthyroidism/hypo-

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