

Editorial

From New Endocrine Entities Requiring New Approaches to New Approaches Leading to New Endocrine Entities

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The dynamics pace of modern society is reflected by the medical community, the public health concerns, the quality of life, as well as the specific spectrum of various disorders. The health impact of these worldwide events is even more visible, starting with early 2020 with the COVID-19 infection spreading from China [1–3]. The field of endocrinology is no exception to this scenario. We highlight three major directions: the first one is that COVID-19-positive patients were initially not considered to be at particular risk for most of the endocrine disorders. Since then, numerous endocrine gland-associated COVID-19 entities were seen over the next three years and the virus virtually affected any gland to different degrees [4]. The consequences of new regulations and norms during the first waves of the COVID-19 pandemic delayed the diagnosis and the management of many endocrine and non-endocrine disorders with a severe impact on general health (as, for instance, delayed surgery for candidates with thyroid cancer), while practitioners used telemedicine as a surrogate of daily physical consultations [5,6]. In the meantime, the general progress in science included cutting-edge aspects of endocrinopathies underlying genetic testing, advanced imaging and surgical procedures, new biomarkers or innovative molecular biology technologies, and, also, the development of multidisciplinary teams dedicated to a particular condition [7,8].

The COVID-19 pandemic required new medical approaches due to its unexpected severity, multileveled social outcomes, and dramatic overall impact. Of the endocrine issues, the thyroid represents one of the most affected glands, either in terms of subacute thyroiditis due to hosting the virus at this level, a thyroid dysfunction accompanying severe illness, or following a pituitary damage or an abnormal autoimmunity amidst stress or infectious triggers. COVID-19-associated subacute thyroid inflammation also takes on a less severe form after COVID-19 vaccination, which requires awareness. This development has not affected the immunization process as far as we know [9–12].

Another major direct impact concerns the genetic background of unusual endocrine cases. The current availability and increased access to genetic testing, for example, in some conditions underlying a short stature or late onset congenital adrenal hyperplasia, might provide a better understanding of these hormonal anomalies, and thus potentially improve clinical practice [13–15]. Besides the special importance of genetic diagnosis in pediatric endocrinology, it is also useful in adults as, for instance, thyroid malignancies [16,17]. It is also particularly important in the genetic evaluations for various endocrine syndromes with autoimmune or tumor components such as multiple endocrine neoplasia [18–20].

Trans-disciplinary approaches involving teams of different specialists in addition to a specialist in endocrinology are important either for providing surveillance for a non-endocrine disorder with endocrine consequences or for severe endocrine pathologies



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with general effects on overall health (as seen in endocrine oncology, cardiovascular endocrinology, etc.) [21]. Clinicians of different medical domains are needed to follow females with beta-thalassemia, including during pregnancy (a rare event, but more common than a decade ago), due to advances in the hematological field and pre-conception counselling. Endocrine involvement in this challenging condition includes almost every gland and has been recently recognized as thalassemic endocrine disease [22,23]. In addition to the progress in gynecological endocrinology and the assisted reproduction techniques, we have more cases of pregnancy in hormonally active disorders as, for instance, in females with active acromegaly [24]. Dermato-endocrinology might represent another valuable interdisciplinary area. Of note, most of the endocrine entities might have a skin and/or an oral clinical expression [25,26]. A case in point is the presence of acanthosis nigricans as a practical and informative tool of insulin resistance accompanying cardio-metabolic conditions with a high epidemiological impact as diabetes mellitus or metabolic syndrome [27,28]. Moreover, the progress of steroid metabolomics, and molecular genetics, includes some aspects of adrenal disorders, such as CYP11B1/B2 84 immunostaining providing more information on particular entities as Conn's or Cushing's syndrome, adrenal incidentalomas, or adrenal cortical carcinoma [29,30].

Integrating these new aspects of every day endocrine practice into a multidisciplinary constellation of approaches in addition to the recent global health concerns and social issues represent a step forward for the benefit of our patients.

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References

1. Khan, R.; Fatima, T.; Ramayah, T.; Awan, T.M.; Kayani, Z.K. Community Safety Behavior in Response to Coronavirus Pandemic. *Illn. Crisis Loss* **2023**, *31*, 73–99. [[CrossRef](#)]
2. Bhimraj, A.; Morgan, R.L.; Shumaker, A.H.; Baden, L.; Cheng, V.C.C.; Edwards, K.M.; Gallagher, J.C.; Gandhi, R.T.; Muller, W.J.; Nakamura, M.M.; et al. Infectious Diseases Society of America Guidelines on the Treatment and Management of Patients with COVID-19. *Clin. Infect. Dis.* **2022**, ciac724. [[CrossRef](#)] [[PubMed](#)]
3. Luo, X.; Lv, M.; Zhang, X.; Estill, J.; Yang, B.; Lei, R.; Ren, M.; Liu, Y.; Wang, L.; Liu, X.; et al. COVID-19 evidence and recommendations working group. Clinical manifestations of COVID-19: An overview of 102 systematic reviews with evidence mapping. *J. Evid. Based Med.* **2022**, *15*, 201–215. [[CrossRef](#)] [[PubMed](#)]
4. Hassan, F.E.; Kadah, A.M.; AlShareef, E.M.; Nukaly, H.Y.; Al-Fadhel, J.A.; AlHartani, M.M.; Ahmed, R.A.; Fagih, S.K. The interplay between severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) and the hypothalamic and endocrinal disorders: A Mini-review. *Egypt J. Immunol.* **2023**, *30*, 73–86. [[CrossRef](#)] [[PubMed](#)]
5. van Kessel, R.; Kyriopoulos, I.; Wong, B.L.H.; Mossialos, E. Has the pandemic enhanced and sustained digital health-seeking behaviour? A big-data interrupted time-series analysis of Google Trends. *J. Med. Internet Res* **2023**, online ahead of print. [[CrossRef](#)] [[PubMed](#)]
6. Stefanou, C.K.; Papathanakos, G.; Stefanou, S.K.; Tepelenis, K.; Kitsouli, A.; Barbouti, A.; Flindris, S.; Tsoumanis, P.; Kanavaros, P.; Kitsoulis, P. Thyroid surgery during the COVID-19 pandemic: Difficulties—How to improve. *Innov. Surg. Sci.* **2022**, *7*, 125–132. [[CrossRef](#)]
7. Memar, E.H.E.; Mohsenipour, R.; Sadrosadat, S.T.; Rostami, P. Pediatric endocrinopathies related to COVID-19: An update. *World J. Pediatr.* **2022**, 1–12. [[CrossRef](#)]
8. Schnell, O.; Battelino, T.; Bergenstal, R.; Blüher, M.; Böhm, M.; Brosius, F.; Carr, R.D.; Ceriello, A.; Forst, T.; Giorgino, F.; et al. Report from the CVOT Summit 2021: New cardiovascular, renal, and glycemic outcomes. *Cardiovasc. Diabetol.* **2022**, *21*, 50. [[CrossRef](#)]
9. Rabaan, A.A.; Smajlović, S.; Tombuloglu, H.; ĆordiĆ, S.; Hajdarević, A.; Kudić, N.; Al Mutai, A.; Turkistani, S.A.; Al-Ahmed, S.H.; Al-Zaki, N.A.; et al. SARS-CoV-2 infection and multi-organ system damage: A review. *Biomol. Biomed.* **2022**, *23*, 37–52. [[CrossRef](#)]
10. Rossetti, C.L.; Cazarin, J.; Hecht, F.; Beltrão, F.E.L.; Ferreira, A.C.F.; Fortunato, R.S.; Ramos, H.E.; de Carvalho, D.P. COVID-19 and thyroid function: What do we know so far? *Front. Endocrinol.* **2022**, *13*, 1041676. [[CrossRef](#)] [[PubMed](#)]

11. Pezzaioli, L.C.; Gatta, E.; Bambini, F.; Facondo, P.; Gava, M.; Cavadini, M.; Buoso, C.; Di Lodovico, E.; Rotondi, M.; Ferlin, A.; et al. Endocrine system after 2 years of COVID-19 vaccines: A narrative review of the literature. *Front. Endocrinol.* **2022**, *13*, 1027047. [[CrossRef](#)] [[PubMed](#)]
12. Darvishi, M.; Nazer, M.R.; Shahali, H.; Nouri, M. Association of thyroid dysfunction and COVID-19: A systematic review and meta-analysis. *Front. Endocrinol.* **2022**, *13*, 947594. [[CrossRef](#)] [[PubMed](#)]
13. Singh, A.; Pajni, K.; Panigrahi, I.; Dhoat, N.; Senapati, S.; Khetarpal, P. Components of IGF-axis in growth disorders: A systematic review and patent landscape report. *Endocrine* **2022**, *76*, 509–525. [[CrossRef](#)] [[PubMed](#)]
14. Ishii, T.; Kashimada, K.; Amano, N.; Takasawa, K.; Nakamura-Utsunomiya, A.; Yatsuga, S.; Mukai, T.; Ida, S.; Isobe, M.; Fukushima, M.; et al. Clinical guidelines for the diagnosis and treatment of 21-hydroxylase deficiency (2021 revision). *Clin. Pediatr. Endocrinol.* **2022**, *31*, 116–143. [[CrossRef](#)] [[PubMed](#)]
15. Baumgartner-Parzer, S.; Witsch-Baumgartner, M.; Hoepfner, W. EMQN best practice guidelines for molecular genetic testing and reporting of 21-hydroxylase deficiency. *Eur. J. Hum. Genet.* **2020**, *28*, 1341–1367. [[CrossRef](#)] [[PubMed](#)]
16. Cherella, C.E.; Wassner, A.J. Pediatric thyroid cancer: Recent developments. *Best Pract. Res. Clin. Endocrinol. Metab.* **2022**, 101715. [[CrossRef](#)] [[PubMed](#)]
17. Tian, T.; Huang, S.; Dai, H.; Qi, M.; Liu, B.; Huang, R. Radioactive Iodine-Refractory Pulmonary Metastases of Papillary Thyroid Cancer in Child, Adolescent, and Young Adult. *J. Clin. Endocrinol. Metab.* **2022**, *108*, 306–314. [[CrossRef](#)]
18. Geurts, J.L.; Strong, E.A.; Wang, T.S.; Evans, D.B.; Clarke, C.N. Screening guidelines and recommendations for patients at high risk of developing endocrine cancers. *J. Surg. Oncol.* **2020**, *121*, 975–983. [[CrossRef](#)]
19. Armeni, E.; Grossman, A. The Spectrum of Familial Pituitary Neuroendocrine Tumors. *Endocr. Pathol.* **2022**, 1–22. [[CrossRef](#)]
20. Bjørklund, G.; Pivin, M.; Hangan, T.; Yurkovskaya, O.; Pivina, L. Autoimmune polyendocrine syndrome type 1: Clinical manifestations, pathogenetic features, and management approach. *Autoimmun. Rev.* **2022**, *21*, 103135. [[CrossRef](#)]
21. Nervo, A.; Retta, F.; Ragni, A.; Piovesan, A.; Gallo, M.; Arvat, E. Management of Progressive Radioiodine-Refractory Thyroid Carcinoma: Current Perspective. *Cancer Manag. Res.* **2022**, *14*, 3047–3062. [[CrossRef](#)] [[PubMed](#)]
22. Ekwattanakit, S.; Hantaweeant, C.; Khuhapinant, A.; Siritanaratkul, N.; Viprakasit, V. An urgent need for improving thalassemia care due to the wide gap in current real-life practice and clinical practice guidelines. *Sci. Rep.* **2021**, *11*, 13283. [[CrossRef](#)] [[PubMed](#)]
23. Shah, F.; Huey, K.; Deshpande, S.; Turner, M.; Chitnis, M.; Schiller, E.; Yucel, A.; Moro Bueno, L.; Oliva, E.N. Relationship between Serum Ferritin and Outcomes in β -Thalassemia: A Systematic Literature Review. *J. Clin. Med.* **2022**, *11*, 4448. [[CrossRef](#)]
24. Bandeira, D.B.; Olivatti, T.O.F.; Bolfi, F.; Boguszewski, C.L.; Dos Santos Nunes-Nogueira, V. Acromegaly and pregnancy: A systematic review and meta-analysis. *Pituitary* **2022**, *25*, 352–362. [[CrossRef](#)] [[PubMed](#)]
25. Slominski, A.T.; Slominski, R.M.; Raman, C.; Chen, J.Y.; Athar, M.; Elmets, C. Neuroendocrine signaling in the skin with a special focus on the epidermal neuropeptides. *Am. J. Physiol. Cell Physiol.* **2022**, *323*, C1757–C1776. [[CrossRef](#)]
26. Raj, R.; Elshimy, G.; Mishra, R.; Jha, N.; Joseph, V.; Bratman, R.; Tella, S.H.; Correa, R. Dermatologic Manifestations of Endocrine Disorders. *Cureus* **2021**, *13*, e18327. [[CrossRef](#)]
27. Ngo, A.; Froessl, L.; McWhorter, J.W.; Perkison, W.B.; Katta, R. Diabetes Detection and Prevention in Dermatology. *Dermatol. Pract. Concept.* **2021**, *11*, e2021131. [[CrossRef](#)]
28. Gołacki, J.; Matuszek, M.; Matyjaszek-Matuszek, B. Link between Insulin Resistance and Obesity-From Diagnosis to Treatment. *Diagnostics* **2022**, *12*, 1681. [[CrossRef](#)]
29. Kebebew, E. Adrenal Incidentaloma. *N. Engl. J. Med.* **2021**, *384*, 1542–1551. [[CrossRef](#)]
30. Braun, L.T.; Vogel, F.; Zopp, S.; Marchant Seiter, T.; Rubinstein, G.; Berr, C.M.; Künzel, H.; Beuschlein, F.; Reincke, M. Whom Should We Screen for Cushing Syndrome? The Endocrine Society Practice Guideline Recommendations 2008 Revisited. *J. Clin. Endocrinol. Metab.* **2022**, *107*, e3723–e3730. [[CrossRef](#)]

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