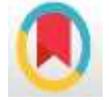




Editorial



Telemedicine Application in Neonatal Resuscitation Programs During COVID-19 Pandemic

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Abstract

One of the drawbacks of COVID-19 infection pandemic is home staying and less transfer and face to face communications resulting in worldwide extension in use of many telecommunication applications. Telemedicine is defined as on-line delivery of health care services (diagnosis, treatment and follow-up) through communications technology devices as smartphones, laptops or androids using telecommunication facilities. All over the last few years, many studies conducted to evaluate the value of application of telemedicine in neonatal disorders like retinopathy of prematurity (ROP), tele-echocardiography, neonatal intensive care unit (NICU), neonatal resuscitation and family support after discharge from NICUs. In this editorial we will highlight the application of telemedicine use in neonatal resuscitation either in the delivery room or in NRP Programs. In conclusion: Telemedicine application in neonatology is a rapidly progressing and becoming integrated into health care services as a way to facilitate access for many neonatal disorders like retinopathy of prematurity (ROP), tele-echocardiography, neonatal intensive care unit (NICU), neonatal resuscitation and family support after discharge from NICUs. We need more studies in Egypt to evaluate the advantages and disadvantages of this modality of health care service.

Keywords: telemedicine, neonatology, ROP, resuscitation, COVID-19, NICU

Introduction

One of the drawbacks of COVID-19 infection pandemic is home staying as long as possible as well as less transfer and face to face communications, but on the other hand, one of the positive effects to this pandemic is worldwide extension in use of many telecommunication applications like zoom, webex meet, and many medical on-line applications [1]. Telemedicine is defined as on-line delivery of health care services (diagnosis, treatment and follow-up) through communications technology devices as smartphones, laptops or androids using telecommunication facilities [2]. That means transfer of the physician experience in a specific health care service online to the patient either directly or through his physician/general practitioner. The need for telemedicine is increasing due to two reasons; the first to cover the gap between different hospitals as regards the availability of expert physicians and the second to decrease the un-necessary transfer of patients to

hospitals [3]. This will improve the patient morbidity and mortality by directing those patients to health care service with expertise without transfer. All over the last few years, many studies conducted to evaluate the value of application of telemedicine in neonatal disorders like retinopathy of prematurity (ROP) [4], tele-echocardiography [5], neonatal intensive care unit (NICU) [6], neonatal resuscitation [7] and family support after discharge from NICUs [8]. In this editorial we will highlight the application of telemedicine use in neonatal resuscitation either in the delivery room or in NRP Programs.

Why telemedicine now?

The American Academy of Pediatrics (AAP) recommended that infants less than 32 weeks of gestation should be delivered in centers with tertiary levels NICUs [9]. Several studies reported that mortality was less among preterm infants who if they delivered and treated in centers with higher levels of neonatal care especially those with tertiary level

NICUs [10, 11]. Unfortunately presence of a neonatologist who is expert in neonatal resuscitation is not the role and many hospitals as well as primary health care centers had a shortage in such service; so, infants who require advanced resuscitation could not reach to NICUs with tertiary levels leading to poor outcomes when delivered at such hospitals [11]. Using recent technology medical online services, like telemedicine, can cover this gap between hospitals with tertiary levels NICUs and those lacking this advantage.

Is telemedicine is applicable for neonatal resuscitation?

When we know that effective ventilation is the most important step in neonatal resuscitation; so, it can be valuable for less expert physicians in neonatal resuscitation to use on-line NPR programs [12]. A recent study conducted by McCauley, et al., 2018 [13] demonstrated the feasibility and safety of a neonatal resuscitation telemedicine program (NRTP) supported local

providers with resuscitation. In another study conducted by Fang JL, et al. 2018 [14]; they found that application of telemedicine in neonatal resuscitation decreased the time needed to establish an effective ventilation which means that less morbidity of hypoxic ischemic insults.

In another study conducted by Makkar et al., 2020 [15], they reported that the outcomes of infants who received a consultation by expert neonatologists using telemedicine during resuscitation is better than for those who did not use telemedicine. Albritton et al [16] reported that application of telemedicine resulted in significant cost savings by preventing the unnecessary transfer of mothers or neonates to hospitals with higher level NICUs.

Successful telemedicine requirement

For successful telemedicine applications, presence of effective equipment's utilized for the audio-visual connection between both the expert neonatologist at the remote site of connection and the

junior physicians in the delivery room is mandatory which may be wireless and mobile like smart phones and tablet or wired and fixed in a fixed place in the delivery room [17, 18].

Wireless devices, such as smartphones and tablets, have the advantages of being affordable, easily mobile and available all over the time. However, deterioration of video image and audio connectivity may occur due to lack of signals or battery problems, while wired devices have more reliable audio and visual connections, but restricted mobility and high cost are disadvantages. Many of expert neonatologists prefer the wired connection devices to safely provide consultation in emergent settings in the delivery room [18]. Therefore, it is advisable for each program to consider connection reliability and available functioning infrastructure before selecting a NRTP technology.

Adding to the above-mentioned equipment's, in cases of NRTP implementation, clear indications for

service activation and the process to communicate with remote neonatologists should be clear and defined in specific guidelines and a professional relationship with all other team members is crucial [19].

American telemedicine association (ATA) is a non-profit association founded in 1993 and now includes more than 400 organizations. Its main target focused on transforming health care services through enhanced, efficient on-line delivery [20]. The American Academy of Pediatrics established a group called supporting pediatric research on outcomes and utilization of telehealth (SPROUT) to study the advantages and disadvantages for application of telemedicine in different pediatric issues including neonatal disorders [19,21].

Telemedicine application in Egypt

In Egypt, there are no studies about applications of telemedicine in neonatology field up to date of writing this editorial but we think that it is the

time for application of telemedicine not only in neonatology field but also in many pediatrics' fields to decrease patient transfer as well as to deliver the experience from experts to junior physicians and finally to decrease the morbidity and mortality in neonates and children.

In conclusion: Telemedicine application in neonatology is a rapidly progressing and becoming integrated into health care services as a way to facilitate access for many neonatal disorders like retinopathy of prematurity (ROP), tele-echocardiography, neonatal intensive care unit (NICU), neonatal resuscitation and family support after discharge from NICUs. We need more studies in Egypt to evaluate the advantages and disadvantages of this modality of health care service.

Conflict of interest

There is no conflict of interest

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References

1. Badr HS, Du H, Marshall M, Dong E, Squire MM, Gardner LM (July 2020). "Association between mobility patterns and COVID-19 transmission in the USA: a mathematical modelling study". *The Lancet. Infectious Diseases*. 20 (11): 1247–1254. doi:10.1016/S1473-3099
2. Nussbaumer-Streit B, Mayr V, Dobrescu AI, Chapman A, Persad E, Klerings I, et al. (April 2020). "Quarantine alone or in combination with other public health measures to control COVID-19: a rapid review". *The Cochrane Database of Systematic Reviews*. 4: CD 013574. doi:10.1002/14651858.
3. Gray JE, Safran C, Davis RB, et al. Baby CareLink: using the internet and telemedicine to improve care for high-risk infants. *Pediatrics*. 2000; 106(6): 1318–1324. doi: 10.1542/peds.106.6.1318.
4. Quinn GE, Ying GS, Repka MX, et al. Timely implementation of a retinopathy of prematurity telemedicine system. *J AAPOS*. 2016; 20(5):425–430. doi: 10.1016/j.jaapos.2016.06.007.

5. Milsten JPK, McCoy M, Makkar A. Utility of telemedicine for screening congenital heart disease in a level II NICU[J]. *J Investig Med*, 2020, 68 (2): 435-710.
6. Rosenfeld BA, Dorman T, Breslow MJ, et al. Intensive care unit telemedicine: alternate paradigm for providing continuous intensivist care. *Crit Care Med*. 2000; 28(12):3925–3931. doi: 10.1097/00003246-200012000-00034.
7. Fang JL, Campbell MS, Weaver AL, et al. The impact of telemedicine on the quality of newborn resuscitation: a retrospective study [J]. *Resuscitation*, 2018, 125: 48-55
8. Garne Holm K, Brødsgaard A, Zachariassen G, et al. Parent perspectives of neonatal tele-homecare: a qualitative study. *J Telemed Telecare*. 2019; 25(4): 221–229. doi: 10.1177/1357633X18765059
9. American Academy of Pediatrics Committee on Fetus and Newborn. Levels of neonatal care. *Pediatrics*. 2012;130(3):587–597. doi: 10.1542/peds.2012-1999.
10. Hoffman AM, Lapcharoensap W, Huynh T, et al. Historical perspectives: telemedicine in neonatology. *Neoreviews*. 2019; 20(3): e113–e123. doi: 10.1542/neo.20-3-e113.
11. Makkar A, McCoy M, Hallford G, et al. A hybrid form of telemedicine: a unique way to extend intensive care service to neonates in medically underserved areas. *Telemed J E Health*. 2018; 24(9):717–721. doi: 10.1089/tmj.2017.0155.
12. Beck JA, Jensen JA, Putzier RF, et al. Developing a newborn resuscitation telemedicine program: a comparison of two technologies. *Telemed J E Health*. 2018; 24(7):481–488. doi: 10.1089/tmj.2017.0121.
13. McCauley K, Kreofsky BL, Suhr T, et al. Developing a newborn resuscitation telemedicine program: a follow-up study comparing two technologies [J]. *Telemed J E Health*, 2020 May; 26(5): 589-596. doi: 10.1089/tmj.2018.0319. Epub 2019 Aug 14.
14. Fang JL, Asiedu GB, Harris AM, et al. A mixed-methods study on the barriers and facilitators of telemedicine for newborn resuscitation [J]. *Telemed J E Health*, 2018, 24(10): 811-817.
15. Makkar A, McCoy M, Hallford G, et al. Evaluation of neonatal services provided in a level II NICU utilizing hybrid telemedicine: a prospective study[J].

- Telemed J E Health, 2020, 26(2): 176-183.
16. Albritton J, Maddox L, Dalto J, et al. The effect of A newborn telehealth program on transfers avoided: a multiple-baseline study [J]. Health Aff (Millwood), 2018, 37(12): 1990-1996.
17. Fang JL, Asiedu GB, Harris AM, et al. A mixed-methods study on the barriers and facilitators of telemedicine for newborn resuscitation. Telemed J E Health. 2018;24(10):811–817. doi: 10.1089/tmj.2017.0182
18. Beck JA, Jensen JA, Putzier RF, et al. Developing a newborn resuscitation telemedicine program: a comparison of two technologies. Telemed J E Health. 2018; 24 (7):481–488. doi: 10.1089 /tmj.2017. 0121.
19. Abhishek Makkar, R Michael Siatkowski, Edgardo Szyld, Abhrajit Ganguly, Kris Sekar. Scope of telemedicine in neonatology. Chin J Contemp Pediatr, 2020, 22(5): 396-408. doi: 10.7499/ j. issn.1008-8830.2001135
20. Home-ATA Main [Internet]. Americantelemed.org. [cited 2019 Feb 01]. Available from: <http://www.americantelemed.org/home> .
21. Gray JE, Safran C, Davis RB, et al. Baby Care Link: using the internet and telemedicine to improve care for high-risk infants [J]. Pediatrics, 2000, 106 (6): 1318-1324.

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