

Mask in pregnant women - Effects on the foetus

www.initiative-corona.info/fileadmin/dokumente/mask_pregnant_women.pdf

20.9.2022

Christian Fiala, MD, PhD, Vienna

Specialist in Obstetrics and Gynaecology

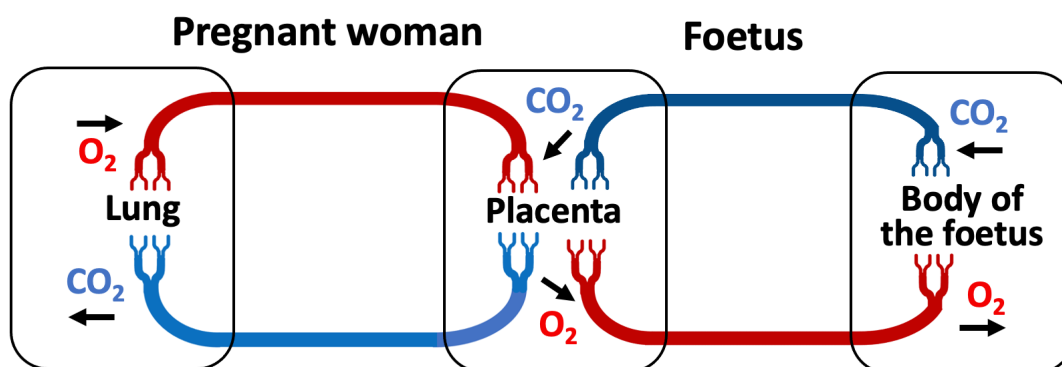
Initiative for Evidence-based Corona Information, www.initiative-corona.info

Summary: It is undisputed that a mask increases respiratory resistance and thereby is an obstruction to breathing. The available data clearly show that this leads to an increase in carbon dioxide, CO_2 in the blood. In pregnant women, this also puts the foetus at risk. Comparable to women who have breathing pauses during sleep, so-called Obstructive Sleep Apnoea Syndrome. Based on the available data, it is feared that by frequently wearing a mask, pregnant women put their child at increased risk for reduced verbal, non-verbal, and overall cognitive performance, caesarean delivery and adjustment disorders after birth.

Care of the foetus during a normal pregnancy

The foetus is fundamentally dependent on the breathing of the pregnant woman throughout the pregnancy until the birth takes place.¹

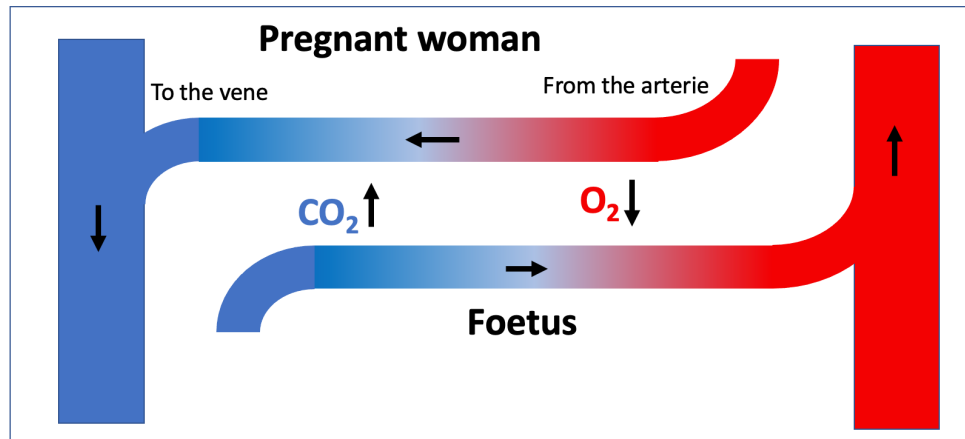
Supply of O_2 to the foetus and expiration of CO_2 during a normal pregnancy (schematic representation)



The foetus is fundamentally dependent on the breathing of the pregnant woman throughout pregnancy.

Since the foetus itself does not breathe, it must obtain oxygen from the pregnant woman's blood and release the CO_2 it produces into her blood. This can only happen via a pressure difference.

Supply of O_2 to the foetus and expiration of CO_2 during a normal pregnancy (schematic representation)



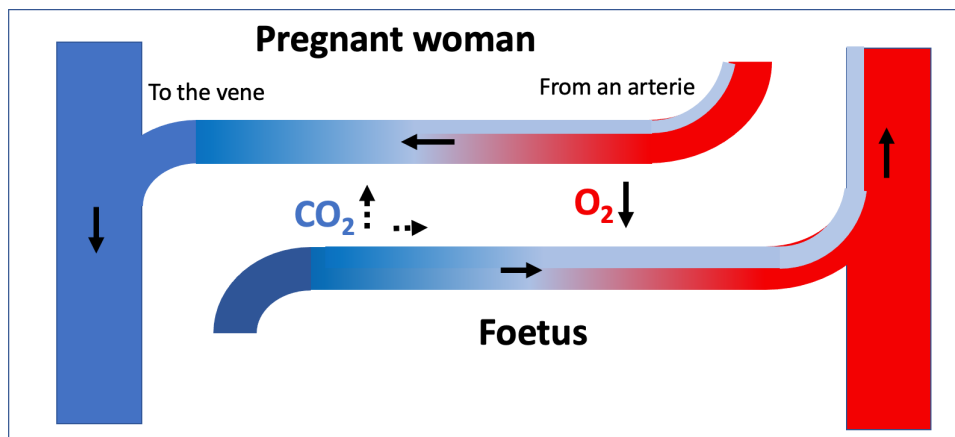
Since the foetus does not breathe itself, it must obtain oxygen from the pregnant woman's blood and release the CO_2 it produces into the pregnant woman's blood. This can only happen via a pressure difference.

Consequently, the oxygen pressure in the foetus is always lower than in the pregnant woman, whereas the CO_2 pressure in the foetus is always higher. Due to the dependence of the foetus, maternal respiration - via CO_2 pressure - has a dominant influence on all foetal parameters.¹ (The level of foetal CO_2 in the umbilical vein (pCO_2) correlates highly significantly with the level of arterial CO_2 in the pregnant woman).

Foetus is very sensitive to obstruction of breathing leading to an increase in CO_2

Thus, any deterioration in the pregnant woman's breathing has an immediate and increased negative effect on the foetus, because it is supplied with less oxygen and at the same time there is an accumulation of potentially harmful CO_2 .¹

Foetus reacts very sensitively to any obstruction of of respiration with an increase in CO_2 (schematic representation)



Any deterioration in the breathing of the pregnant woman has an immediate and increased negative effect on the foetus, because it is supplied with less oxygen and at the same time there is an accumulation of potentially harmful CO_2 .

It is particularly important to avoid an increase in CO₂ levels during pregnancy, because even slight increases can lead to negative or toxic effects, including developmental disorders and malformations.² This is one of the reasons why pregnant women are strongly advised not to smoke cigarettes and why the CO₂ content on submarines is strictly regulated.^{3,4}

CO₂ measurement is also an important parameter because it indicates respiratory problems more sensitively than oxygen saturation or other respiratory parameters.⁵

Natural protective mechanism of the foetus against too high CO₂ levels

With normal breathing and thus normal CO₂ levels in the woman, the values in the foetus would inevitably be higher, as described, and would thus reach toxic levels. In order to provide the foetus with sufficient oxygen despite the more difficult, because only indirect, supply and to remove the CO₂ effectively, avoiding a harmful accumulation, the pregnancy hormone progesterone leads to increased breathing (hyperventilation) and a widening of the airways. This causes the CO₂ pressure in the pregnant woman's blood to drop from normally 35 to 46 mmHg to below 30 mmHg.⁶ It is this lower CO₂ pressure in the pregnant woman's blood that enables the foetus to easily release the CO₂ it produces there and to develop at normal CO₂ levels without any accumulation.

Obstruction of breathing endangers the foetus

However, this natural protection against CO₂-induced growth disturbance is not enough if the pregnant woman's breathing is obstructed. This occasionally happens when pregnant women have unnoticed pauses in breathing during sleep, so-called obstructive sleep apnoea syndrome. This is especially common towards the end of pregnancy and in overweight women when the size of the uterus obstructs breathing. The pauses in breathing lead to a poorer supply to the foetus, in particular an increase in CO₂, which has been shown to lead to numerous problems such as growth retardation, premature birth, increased caesarean births, poorer adjustment after birth and risk of intensive care treatment.^{6,6,7,8,9,10}

Mask endangers the foetus

Similarly, wearing a mask (so-called mouth-nose protection) is an obstacle to breathing. It increases the concentration of CO₂ during inhalation,^{11,12} resulting in significantly less CO₂ being exhaled.¹³

This causes the CO₂ pressure in the blood to increase significantly by up to 5.5 mmHg after a so-called surgical mask is put on in adults (normal value 35 to 46 mmHg).¹⁴

In a pregnant woman, this increase in CO₂ counteracts the described natural lowering of CO₂ during pregnancy and can compensate this life-saving adaptation. This severely limits the supply to the foetus, which is much more affected by respiratory disturbances than the pregnant woman.

These negative effects of wearing a mask are even more significant if there is an additional breathing problem, such as the frequently occurring pauses in breathing towards the end of pregnancy described above and/or a lung disease.^{15,16}

Wearing a mask and the resulting impeded breathing thus partially or completely removes the natural protection of the foetus by means of the described increased breathing during pregnancy and exposes the foetus to risks similar to those of women with Obstructive Sleep Apnoea Syndrome.

Mask during birth - an additional risk in an extremely critical situation

The dependence of the foetus on adequate breathing by the pregnant woman is particularly great during birth.^{17,18} Due to the contractions and the resulting high pressure in the uterus, the blood supply to the foetus is interrupted for the duration of contractions and can only take place during the pauses in labour. This compensatory mechanism, which is essential for the foetus during the pauses in labour, is, however, significantly reduced by increase in CO₂ in the pregnant woman's blood due to a mask. This further and unnecessarily increases the risk to the foetus in this already sufficiently critical phase.

First indications of risk to children of two cohorts

A recent study seems to confirm these fears.¹⁹ There was an alarming reduction of cognitive performance of 27-37% among children born during the Corona measures compared to children born in the 10 years before. The reduction was found in all areas, including verbal, motor and general mental cognitive performance. The authors' make another worrying statement that it is not yet possible to say whether the decline in cognitive performance will be permanent or whether the children will catch up. The analysis of the possible causes has not yet been completed, but there is much to suggest that wearing a mask by the pregnant women is the cause of this dramatic finding.

Based on the available knowledge, such fears were already expressed at a press conference in October 2020.²⁰ At that time, four doctors presented scientific data on the basis of which massive negative effects of the numerous Corona measures were to be feared, especially in pregnant women. However, the immediate suspension of all measures demanded at the time was ignored by politicians. Now more and more of this seems to be coming true. To the suffering of the countless people affected.

Generally accepted principles were ignored

There is a generally accepted principle that any measures should only be used on pregnant women with great caution and after sufficient review. A striking and lasting event was the so-called thalidomide scandal around 1960. At that time, a sleeping pill was approved and advertised as a harmless drug against pregnancy sickness without sufficient clinical testing. The result was dramatic. About 10,000 children were born with missing or seriously deformed arms or legs. Because of the delayed visibility of the consequences on the foetus and because of massive resistance to acknowledge the cause, it took four years from approval until the drug was finally withdrawn from the market. Also worrying, the first indications of the drug being the cause of the malformations by the paediatrician Dr. Lenz were not taken seriously and did not lead to an immediate withdrawal of the drug, which could have prevented further damage. Instead, the doctor was covered with legal action by the manufacturer in order to silence him, which unnecessarily exposed numerous

other children to the harmful drug and caused them to be born with severe malformations.^{21,22,23,24}

A similar situation is repeated today: well-founded scientific criticism of the Corona measures is not taken up in order to improve the situation or factually refuted, but the critics are defamed, publicly pilloried and legally prosecuted, sometimes with police-state methods. Unfortunately, this attempt to cover up impending harm only leads, in turn, to many more people unnecessarily paying with their health or even life for the actions of politics.

What can we learn from the past?

Therefore, the most important lesson we must learn from this and other scandals in medicine is: Any suspicion of possible harm to the foetus must be taken very seriously and all procedures in pregnant women in this regard must be suspended immediately until there are clear results proving that they are harmless.

For the current situation, this means that pregnant women must not only be exempted from any obligation to wear a mask, but they must be actively warned against wearing a mask during pregnancy. Regardless, newborns born in the last 2 years should be closely followed to confirm or rule out any possible harm from mask wearing of their mother during pregnancy.

Who bears the responsibility?

By means of an unjustified fear of the Corona virus, the population could be kept in shock-paralysis for a while. But the negative consequences of the Corona measures, including mask-wearing, social isolation and vaccination, are so catastrophic and frequent that the extent can no longer be concealed. But this raises more and more the question of responsibility:

- Why and by whom were the measures introduced against all evidence?
- And who will pay for the damage caused?

In the near future our society will face many difficult discussions on this aspect.

References

- ¹ V. M. Roemer, Messgrößen in der Perinatalmedizin - das pCO₂, Z Geburtshilfe Neonatol 2005; 209(3): 90-99.
- ² Guais et al. Toxicity of carbon dioxide: a review. Chem Res Toxicol. 2011 Dec 19;24(12):2061-70. doi: 10.1021/tx200220r.
- ³ Howard et al. Submarine exposure guideline recommendations for carbon dioxide. Birth Defects Res. 2019 Jan 1;111(1):26-33.
www.ncbi.nlm.nih.gov/30511437
- ⁴ QinetiQ's new submarine air systems support female UK Royal Navy submariners, 2014, www.naval-technology.com/news/newsqinetiqs-new-submarine-air-systems-support-female-uk-royal-navy-submariners-4354850/
- ⁵ Overdyk et al. Continuous Oximetry/Capnometry Monitoring Reveals Frequent Desaturation and Bradypnea During Patient-Controlled Analgesia, Anesthesia & Analgesia: August 2007 - Volume 105 - Issue 2 - p 412-418

-
- ⁶ Orth et al. Obstruktives Schlafapnoesyndrom und Schwangerschaft. *Pneumologie* 2018; 72(03): 187-196. <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0043-113429>
 - ⁷ Sahin FK et al. Obstructive sleep apnea in pregnancy and fetal outcome. *Int J Gynaecol Obstet*, 2008 Feb;100(2):141-6.
 - ⁸ Yang Z, et al. Association between adverse perinatal outcomes and sleep disturbances during pregnancy: a systematic review and meta-analysis, *J Matern Fetal Neonatal Med* 2020 Jan 13;1-9.
 - ⁹ Fung et al. Effects of Maternal Obstructive Sleep Apnoea on Fetal Growth: A Prospective Cohort Study. *PLoS ONE*, 2013, 8(7): e68057.
 - ¹⁰ Obstructive Sleep Apnea in Pregnant Women: A Review of Pregnancy Outcomes and an Approach to Management, Dominguez et al., *Anesth Analg*. 2018 November ; 127(5): 1167–1177
 - ¹¹ Martellucci et al. Inhaled CO₂ concentration while wearing face masks: a pilot study using capnography, *medRxiv* 2022.05.10.22274813; doi: <https://doi.org/10.1101/2022.05.10.22274813>
 - ¹² Kisielinski et al. Is a Mask That Covers the Mouth and Nose Free from Undesirable Side Effects in Everyday Use and Free of Potential Hazards?. *Int. J. Environ. Res. Public Health* **2021**, 18,4344. <https://doi.org/10.3390/ijerph18084344>
 - ¹³ Tong et al. Respiratory consequences of N95-type Mask usage in pregnant healthcare workers—a controlled clinical study. *Antimicrob Resist Infect Control* **4**, 48 (2015). <https://doi.org/10.1186/s13756-015-0086-z>
 - ¹⁴ Ulrike Butz, Rückatmung von Kohlendioxid bei Verwendung von Operationsmasken als hygienischer Mundschutz an medizinischem Fachpersonal, 2005, Technische Universität München, <http://mediatum.ub.tum.de/?id=602557>
 - ¹⁵ Mo et al., Risk and impact of using mask on COPD patients with acute exacerbation during the COVID-19 outbreak: a retrospective study, *Research Square preprint*, DOI:10.21203/rs.3.rs-39747/v1, <https://www.researchsquare.com/article/rs-39747/v1>
 - ¹⁶ Kyung et al., Risks of N95 Face Mask Use in Subjects With COPD, *Respiratory Care* May 2020, 65 (5) 658-664; DOI: <https://doi.org/10.4187/respcare.06713>
 - ¹⁷ Rooth et al., The Acid-Base Status of the Fetus during Normal Labor, in *Proceedings of the Symposium RESPIRATORY GAS EXCHANGE AND BLOOD FLOW IN THE PLACENTA*, in Conjunction with the XXV International Congress of Physiological Sciences, 4.-6. August 1971, Hannover, S 477-86
 - ¹⁸ Wulf et al., CLINICAL ASPECTS OF PLACENTAL GAS EXCHANGE, in *Proceedings of the Symposium RESPIRATORY GAS EXCHANGE AND BLOOD FLOW IN THE PLACENTA*, in Conjunction with the XXV International Congress of Physiological Sciences, 4.-6. August 1971, Hannover, S 505-21 <https://books.google.at/books?id=7eNqAAAAMAAJ&hl=de>
 - ¹⁹ Deoni et al. The COVID-19 Pandemic and Early Child Cognitive Development: A Comparison of Development in Children Born During the Pandemic and Historical References, *medRxiv* 2021.08.10.21261846; <https://doi.org/10.1101/2021.08.10.21261846>
 - ²⁰ Initiative für Evidenzbasierte Corona Information, Pressekonferenz, 7.10.2020 www.ots.at/presseaussendung/OTS_20201007_OTS0081/mediziner-angst-vor-corona-voellig-ueberzogen
 - ²¹ Der Contergan-Skandal, eine Dokumentation des WDR, <https://www1.wdr.de/archiv/contergan/index.html>
 - ²² Contergan-Skandal ist ein Beispiel für staatliche Hilfslosigkeit, *Deutsches Ärzteblatt*, 17. Mai 2016, www.aerzteblatt.de/nachrichten/67696/Contergan-Skandal-ist-ein-Beispiel-fuer-staatliche-Hilfslosigkeit
 - ²³ Chronik des Contergan-Falls, eine Dokumentation des WDR, <https://www1.wdr.de/archiv/contergan/contergan176.html>

²⁴ Porträt über Widukind Lenz, Der Mann, der Contergan stoppte
<https://www1.wdr.de/archiv/contergan/contergan156.html>