

Case Report

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AntiCovid Masks Cause Hypercapnia/Rebreathing during Sedation

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Abstract

Patients undergoing plastic surgery wearing their own cloth masks during sedation show hypercapnia, rebreathing and occasionally low FiO₂. It is probable that people wearing their own cloth masks would exhibit the same trend while walking.

Keywords: Breathing; CO₂; Covid 19; Masks; Sedation

Introduction

CDC recommends that people wear masks in public settings and when around people who don't live in their household, especially when other social distancing measures are difficult to maintain [1]. Up to now In Italy masks should be worn always in indoor spaces and are mandatory all over the country to wear them even outdoor [2]. Accordingly we allowed office surgeries done under light/moderate sedation to proceed with patients maintaining their own face masks. We present the data on etCO₂ measured under these clinical conditions.

Materials and Methods

All adult patients ASA 1 and 2 undergoing plastic /cosmetic operations (liposuction, miniabdomen, breast augmentation, combination of) operated at one private office facility from the end of a the lockdown period (15th may 2020-end of June 2020) were sedated with various drug combinations, including midazolam, / fentanyl or meperidine or promazine/meperidine/midazolam and operated under local infiltration analgesia with lidocaine 0.2/0.25%+ epinephrine 1.200.000. All completed a written health questionnaire and signed an informed consent. Beside the usual noninvasive monitoring (ECG, NIBP, SaO₂, temperature) (Datex Cardiocap), all expiratory and inspiratory gases (with special attention to O₂ and CO₂) were continuously sampled under the masks (Salter lab divided cannulas®) and analyzed with a Datex Capnomac ,routinely calibrated and after allowing at least 15 minutes of warm up. Vital signs were collected every 5 min and patients maintained a light/moderate level of sedation (Ramsay scale score between 2 and 3) [3], with stable vital signs. Ethical approval for this study is not required because monitoring and

anesthetic techniques employed were routine practice and the study resulted from retrospective analysis of prospectively collected usual patient data.

Results

All patients exhibited mild hypercapnia, median 42-45 mmHg and rebreathing , between 3 and 5 mmHg. Some patients showed FiO₂ of 20 mmHg at baseline, before sedation. Low flow oxygen under the mask was administered at 0.5-1 lt min in order to maintain a SaO₂>94% and FeO₂>18. Some examples are shown in the pictures (Figures 1-4). All sedations were successful, all patients discharged home within 3 h, fully satisfied with the procedure.



Figure 1: etCO₂ rebreathing (FiCO₂ 5 mmHg) since the capnogram does not return to baseline; slight hypercapnia. O₂ flow 0.5 lt/min under the mask. Resp rate 18.

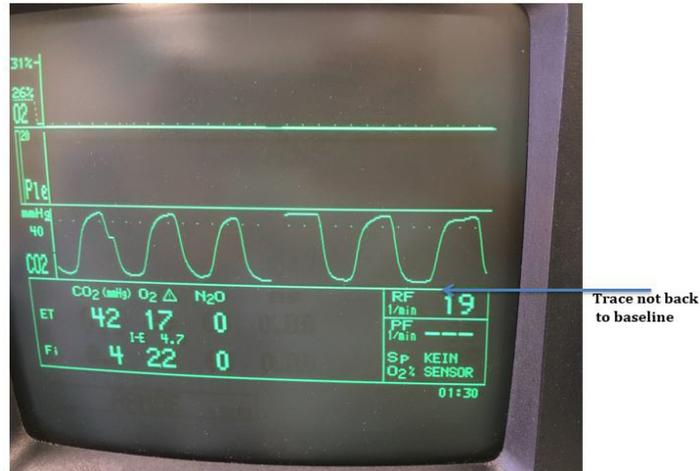


Figure 2: etCO₂ rebreathing (FiCO₂ 4 mmHg) since the capnogram does not return to baseline; slight hypercapnia. O₂ flow 0.5 lt/min under the mask, Resp rate 19.

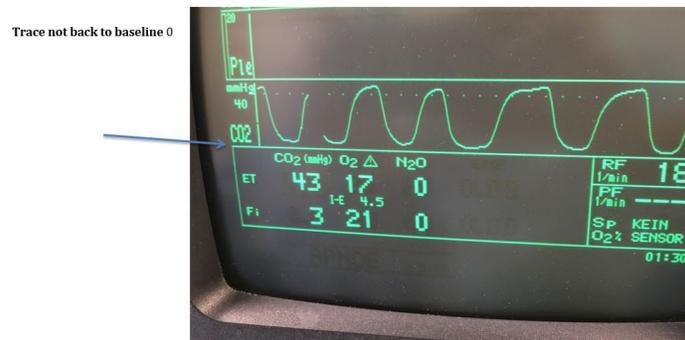


Figure 3: etCO₂ rebreathing (FiCO₂ 3 mmHg) since the capnogram does not return to baseline; slight hypercapnia. O₂ flow 0.5 lt/min under the mask, Resp rate 18.

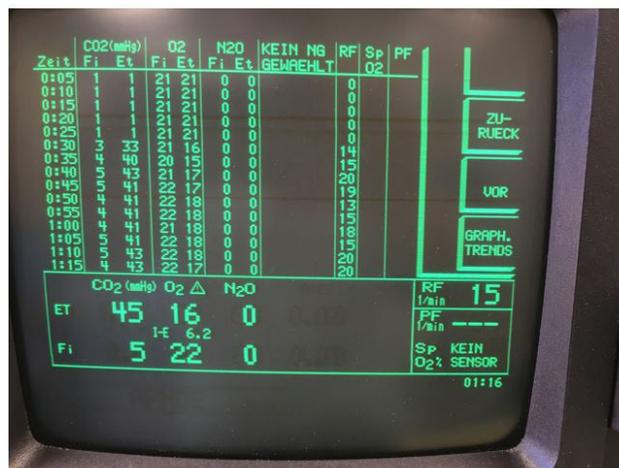


Figure 4: Tabular trend, numeric as above.

Discussion

Carbon dioxide alters cerebral blood flow: every 1 mmHg increase in PaCO₂ corresponds to a roughly 4% increase in cerebral blood flow [4,5].

However no one complained of headache, the usual side effect due to increased cerebral flow while this has been noted by many patients reporting to their family doctors. It is assumed that even normal people wearing face masks do rebreath a significant amount of CO₂ and this could have important consequences for people with respiratory or cardiac disease and make difficult exercising. We cannot advocate the continuous use of the face masks indoor or outdoor for all people, since rebreathing and hypercapnia are common and a low FiO₂ may occur. Our observations done on healthy patients lying supine should be repeated on normal people standing and walking; it could be of great interest to repeat our work analyzing all inspiratory and expiratory gases of people treadmill walking in a cardiorespiratory lab while wearing anticovid 19 masks.

Conclusion

In conclusion, patients may be allowed to keep their own masks even in the OR providing that there is a continuous

monitoring of all inspired and expired gases. All patients present some degree of rebreathing during the procedure and some low FiO₂ at baseline.

References

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