108 - MONITORING OF OXYGEN THERAPY IN ADULT HOSPITALIZED

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INTRODUCTION

Oxygen therapy is a treatment method in which there inhalation of oxygen (O2), where a pressure less than the ambient air facilitates gas exchange in the lungs, thereby reducing the work of breathing. It is mainly indicated for patients with hypoxemia, respiratory failure, respiratory infection (mainly pneumonia) (CAMARGO et al., 2008). The indication of oxygen must be supplied accurately, using oxygen flows needed to maintain the necessary tissue of the body.

Criteriamustbe establishedfor usetheoxygen, as monitoringconcentrationO2administeredandbloodO2saturation, andthus avoidtheunnecessary administrationorhigh concentrations ofO2, which may bring abouttoxic effects on theindividual (TAMEZ, 1999.)

To quickly identify as are gas exchange pulse oximetry device is most appropriate, because it shows the oxygen saturation of the patient at the moment (Mendes, 2010). Pulse oximetry in adults presents normal values of arterial oxygen saturation (SpO2) in ambient air, in other words, for a fraction of inspired oxygen (FiO2) close to 21% are between 96% and 100% corresponding to around PaO2 90 to 100 mmHg. The SpO2 between 91% and 92% is retained when thePaO2is around60 mmHg, with a standard deviationof ±3%. The heart beat presents normal values at rest between 60 and 100 beats per minute (SINEX, 1999).

When oxygenis administered correctly have been several positive physiological effects to the body, such as the improvement of pulmonary gas exchange, pulmonary arterial vasodilation, decreased pulmonary resistance and pulmonary artery pressure, improves cardiac output, decreased the work of the heart muscle and systemic vasoconstriction. However, when improperly managed, that is, as supplementation to more than the body actually needs, can lead to pulmonary dysfunction caused by changes in central nervous system and cardiovascular due to the release of free radicals and by evency to toxic effects (LORENA et al., 2009).Oxygen when used improperly can cause serious complications to the organism.

The major limitation to the use of the oxygen therapy is the toxicity that dependent on the absolute pressure of the oxygen supplied, the duration of exposure and the sensitivity of each individual. The main side effects that may be caused by hyperoxia is atelectasis by high oxygen concentration and pulmonary epithelial damage due to oxidative stress, retinopathy of prematurity, chronic lung disease and broncho pulmonary dysplasia in prematures, depression of mucociliary activity, nausea, anorexia, headache and trachea bronchitis (SARMENTO, 2007).

Theoxygen therapy can be administered at high or low flows, low flowsin the fraction of inspired oxygen(FiO2) is fixed and the oxygen is less than orequal torequests from the individual, already in high flows supply exceeds demand and we can regulate FiO2. The most used devices in the use of oxygen therapy is nasal cannula and catheters, oxygen masks and Venturi, oxygen tents or by mechanical ventilation. The most commonly mode of deliveryusedin hospitals is by oxygen circuit.

So, there is a need for rigorous evaluation and monitoring the administration of oxygen. The physiotherapist is the most interested in the control of these parameters, because any change can cause serious damage to the respiratory system. This study aimed to describe the supply of oxygen to the needs of hospitalized individuals, as well as yourbidding device, method and means of administration.

DEVELOPMENT

This type of epidemiological study qualitative and quantitative aims to describe the use of oxygen therapy in hospitalized adults. The study included 40 individuals of both sexes, who were admitted to the hospital studied making use the oxygen, they suffered nohealth risk. We excluded subjects younger than18 years and without oxygen administration.

The search was done at a hospital in Cascavel-PR, in the period June – August 2013, the informations were collected by the researcher and stored in spreads heets, presenting no

risk or discomfort to the individuals. Were collected personal data (name, surname , age, reason for admission, comorbidities), SpO2 with the rest individual through the device oximeter (Oxyn®) (in the ends of the hands), the value of FiO2, that was collected by the oxygen flow meteror the permitted value mechanical ventilator, and PaO2 value, obtained by the value presented in the arterial blood. Also considered was the mode of administration, supply and devices used.

RESULTS

Thes ample consisted of 40 subjects,17 males and 23 females, aged between 21-89 years with an average of 60 ±21,28. Of the 40 subjects19 were on mechanical ventilation (MV) representing 47.5%, four with oxygen mask(10%), 16 inoxygen tent(40%) and one ina Venturi mask (2.5%) and all (100%) had supply mode oxygen circuit. Hyperoxia was observed in 60% of subjects with a meanFiO2 offered of 0,41 ±0.08 generating average SpO2 98 ±0,02%, leading to an average of 119,15 ± PaO2 40 mmHg according to Table 1.

Table 1 – Mean values and standard deviation of age,FiO2, SpO2 and PaO2

Variables	N	Mean	Standard Deviation
Age	40	60	21,28
FiO_2	40	0,41	0,08
$SpO_{2\ (\%)}$	40	98	0,02
$PaO_{2\ (mmHg)}$	40	119,15	40

Based on these results we can see that the oxygen offer was beyond the need for individuals with a high oxygen saturation, generating an oxygen pressure above100 mmHg that indicates hyperoxia. To maint a in saturation with in the normal range is only required oxygen pressure of 60 mmHg. The subjects of the sample showed the majority (60%) a PaO2 higher than100 mmHg, in other words the administration of oxygen was used unnecessarily.

By in haling high concentrations of oxygen the capacity entrainment of carbon dioxide gasis decreased by venous hemoglobin, because the venous hemoglobinis saturated with oxygen, there by increasing the retention of partial carbon dioxide pressure tissue, thus an enhancement of toxicity in the central nervous system (CLARK; THOM, 2004).

Prolonged exposure to oxygen partial pressure above 0,5 can cause no pulmonary toxicity and short exposures above 1,6 result in complications in the central nervous system, concluding that oxygen when in haled in high concentrations can cause serious damage to the body of individuals. The most important signs and symptoms caused by oxygen toxicity are seizures, nausea, vomiting, spasmodic, vertigo, facial pallor, palpitations, dilated pupils, sweating, bradycardia, hallucinations, confusion, and syncope (CLARK; THOM, 2004).

In the study by Mendes et al (2010), the saturation was assessed in 198 individuals, in which 89 were a mended and 76 of these had hyperoxia. Thus concluded that it is necessary monitoring and awareness of the multidisciplinary team in patient susing oxygen.

Chow et al (2003), cites in his research that was decreased SpO2 in neonates of 85-95% to 85-92% and observed that babies had a lower incidence of retinopathy of prematurity from 4,5% to 1,5%, noting that the smaller saturation and the lower oxygen concentrations, decreased the indices of injury to the subject. Sun (2010) also compared two levels of saturation in newborns, a level between 85-89% and another 91-95%, observed after analysis that babies who received lower saturation evel had a higher mortality rate before leaving the hospital, all thought new borns with higher saturation showed a higher frequency of severe retinopathy. Askie et al (2001), can observe lower rates of oxygen decreased the incidence of retinopathy of prematurity.

New borns who are exposed to 100% oxygen for more than three minutes three times increase in the risk of developing cancer in child hood (SPECTOR et al, 2005).

Oxygen therapyis essential for the treatment of some diseases and can quickly revert some cases avoiding worsening of hypoxemia and even preventing death, however must be managed properly for each individual as needed. The high concentrations of oxygen offered to individuals can cause serious damage to organisms, besides being a waste of oxygen. The administration of oxygen should be precise and needs a frequent monitoring to prevent damage to the subjects, both by hypoxia and by hyperoxia.

CONCLUSIONS

Through this research we can identify that oxygen therapy has great value when used correctly, but it can be observed that in most research subjects it was administered improperly, being offered in addition to the oxygen needed by individuals, generating hyperoxia, high fractions of inspired and elevated SpO2. The oxign circuit was the main form of delivery through the masks and devices through mechanical ventilatory support. Thus, these subjects are exposed to toxic and deleterious effects caused by the excess oxygen in the organism. There was a small amount of studies addressing the monitoring and complications caused by improper use of oxygen in adults.

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MONITORINGOFOXYGEN THERAPYINADULTHOSPITALIZED

ABSTRACT

Introduction: The oxygen therapy consists in a treatment which the partial pressure of oxygen in arterial bloodis increased through greater concentration of oxygen in inspired air. Oxygen therapys could be indicated a curately for each individual, being used mainly in lower airway inflammation, respiratory failure and hypoxemia. Improper use can cause damage to the organism of individuals and high concentrations of oxygen generate free radicals, which can develop alterations in the central nervous system. Objectives: To describe the offer, modes and devices used in oxygen use in adults hospitalized. Method: The study included 40 subjects, 17 males and 23 females, aged between 21-89 years who were admitted in hospital making use of oxygen. Results: The mean FiO2 offered was 0,41 ± 0,08 SpO2 generating average 0,98 ± 0,02%, leading to an average of 119,15 ± PaO2 40 mmHg identifying hyperoxia in 60% of subjects. The main form of administration was oxigen circuit via mechanical ventilation and the use of masks. Conclusion: It was observed that the oxygen was offered in addition to the

necessary individuals, generating an oxygen pressure above 100 mmHg generating hyperoxia, exposing the individuals to the harmful effects of the high oxygen concentration.

KEYWORDS: Oxygen; Monitoring; Toxicity.

SUIVIDE LA THÉRAPIEDE L'OXYGÈNEDANSADULTES HOSPITALISES

RÉSUMÉ

Introduction: Le traitement consiste en un traitement à l'oxygène, dans lequel la pression partielle de l'oxygène dans le sang artériel est augmentée par une plus grande concentration d'oxygène dans l'air inspiré. L'oxygénothérapie doit être indiqué avec précision pour chaque individu, utilisé principalement dans le bas inflammation des voies respiratoires, une insuffisance respiratoire et une hypoxémie. Une mauvaise utilisation peut causer des dommages à l'organisme de l'individu et de générer de fortes concentrations de radicaux libres de l'oxygène, qui peuvent développer des altérations du système nerveux central. Objectifs: Décrire l'offre, les modes et les dispositifs utilisés dans l'utilisation de l'oxygène chez les adultes hospitalisés. Méthode: L'étude a inclus 40 sujets, 17 hommes et 23 femmes, âgés entre 21-89 ans qui ont été admis à l'hôpital en utilisant de l'oxygène. Résultats: La FiO2 moyen offert était de 0,41 ± 0,08 SpO2 moyenne générer 0,98 ± 0,02%, ce qui conduit à une moyenne de 119,15 ± 40 mmHg PaO2 identifier une hyperoxie dans 60 % des sujets. La principale forme d'administration a été mis en réseau via la ventilation mécanique et l'utilisation des masques. Conclusion: Il a été observé que l'oxygène a été offert en plus de personnes nécessaires, générant une pression d'oxygène au-dessus de 100 mmHg indiquant hyperoxia causant des individus aux effets délétères de l' exposition à l'oxygène. Le travail consistait à travers le réseau et les périphériques offrent plus d'employés ont le ventilateur mécanique et des masques.

MOTSCLES: Oxygène; Surveillance; Toxicité.

MONITOREODE LA TERAPIADE OXÍGENOENPACIENTESADULTOS

RESUMEN

Introducción: El tratamiento consiste en una terapia de oxígeno en el que la presión parcial de oxígeno en la sangre arterial se incrementa a través de una mayor concentración de oxígeno en el aire inspirado. La terapia de oxígeno se debe indicar con precisión para cada individuo, que se utiliza principalmente en la inflamación de las vías respiratorias inferiores, insuficiencia respiratoria e hipoxemia. El uso inapropiado puede causar daños en el cuerpo de las personas y generar altas concentraciones de radicales libres de oxígeno, que pueden desarrollar alteraciones en el sistema nervioso central. Objetivos: Describir la oferta, los modos y dispositivos utilizados en el uso de oxígeno en adultos hospitalizados. Método: El estudio incluyó a 40 pacientes, 17 varones y 23 mujeres, con edades entre 21 a 89 años que fueron ingresados en el hospital haciendo uso de oxígeno. Resultados: La media FiO2 ofrecido fue de 0,41 ± 0,08 SpO2 promedio de generación de 0,98 ± 0,02 %, lo que lleva a un promedio de 119,15 ± 40 mmHg PaO2 identificar una hiperoxia en el 60 % de los sujetos. La principal forma de administración está conectada en red a través de la ventilación mecánica y el uso de máscaras. Conclusión: Se observó que el oxígeno se le ofreció, además de los individuos necesarios, la generación de una presión de oxígeno por encima de 100 mmHg indicando hiperóxia unir a las personas de los efectos nocivos de la exposición al oxígeno. El trabajo era a través de la red y los dispositivos ofrecen más empleados fueron la ventilación mecánica y de la cara.

PALABRAS CLAVE: Oxígeno; Monitoreo; Toxicidad.

MONITORAMENTO DA OXIGENOTERAPIA EM ADULTOS HOSPITALIZADOS

RESUMO

Introdução: A oxigenoterapia consiste em um tratamento em que a pressão parcial do oxigênio no sangue arterial é aumentada por meio de maior concentração de oxigênio no ar inspirado. A administração de oxigênio deve ser indicada de maneira precisa para cada individuo, sendo utilizado principalmente na inflamação das vias aéreas inferiores, na insuficiência respiratória e na hipoxemia. O uso inadequado pode causar danos ao organismo dos indivíduos e altas concentrações de oxigênio geram liberação de radicais livres, que podem desenvolver alterações no sistema nervoso central. Objetivos: Descrever a oferta, modos e dispositivos empregados no uso do oxigênio em indivíduos adultos hospitalizados. Método:Participaram do estudo 40 indivíduos,17 do sexo masculino e 23 do sexo feminino, com faixa etária entre 21 a 89 anos, que estavam internados no hospital fazendo uso de oxigênio. Resultados: A média de FiO2 ofertada foi de 0,41±0,08 gerando média de SpO2 0,98 ±0,02%, levando a uma PaO2 média de 119,15 ±40 mmHg identificando uma hiperóxia em 60% dos sujeitos. A principal forma de administração foi em rede através do suporte ventilatório mecânico e do uso de máscaras. Conclusão: Observou-se que a oferta de oxigênio foi além do necessário aos indivíduos, gerando uma pressão arterial de oxigênio acima de 100 mmHg indicando hiperóxia, expondo os indivíduos aos efeitos deletérios da alta concentração de oxigênio.

PALAVRAS CHAVE: Oxigênio; Monitoramento; Toxicidade.