CONTRIBUTO DOS MUSCULOS RESPIRAT6RIOS PARA A FISIOPATOLOGIA DA IIIPERCAPNIA NA DOEN<;:A PULMONAR OHSTRUTIVA CR6NICA ESTABILIZADA/CRISTINA 13ARI3ARA. MIGUEL MOTA CARMO. IOLANDA CORREIA. ROSA SANTOS, ISABEL GON<;:ALVES. CAMILA CANTEIRO, ANT6NIO RENDAS, RAM IIW A VILA.

daqueles musculos. A fisiopatologia desta fraqueza muscular local izada permanece ainda por esclarecer, se bern que existam alguns estudos que apontam para fen6menos de remodelar;ao das fibras musculares, como adaptac;ao as exageradas cm·gas respirat6rios a que estes musculos sc encontram expostos 135

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tes estudos demonstrando, na fase avanc;ada da do-enc;a, aumento da proporc;ao de fibras de contracpo lenta ou tipo I, apontam para que a hipercapnia rc-prcscnte um marcador de aclaptac;ao que confere maior resistl:ncia a fadiga, a troco de alguma pcrda da capacidade contract it.
Adicionalmente, tambl!m nao pocle ser exclufda da fisiopatologia da fraqueza localizada do diafrag-ma, o papel da exposir;ao aos corticoster6ides, devi-do as inumeras agudizar;oes respirat6rias que estes doentes sofrem nas fases avanr;adas da doenr;a e utilizar;ao daqueles farmacos nessas circunstancias. Por ultimo, e de acordo com os nossos resulta-dos, mais importante para a genese da hiperdpnia, do que a diminuir;ao da capacidade contractil do dia-fragma, parece ser, para alem do grau de obstntc;ao bronquica, o aumento da razao PO, 1/Plm"'· dado que esta razao tanto reflecte a drive neurol6gica, como a reserva fun cional em forr;a dos mu sc ulos inspirat6rios, disponfvel para o acto respirat6rio. Assim, encontrando-se aumentada a referida razao, pequenas diferenr;as, no sentido da diminuic;ao da forr;a diafragmatica, poderao no doente com D.P.O.C. em fase avanr;ada, ser o mecanismo promotor da fa-lc!ncia da bomba ventilat6ria, com surgimento da hipcrdpnia.
Em nossa opiniao, os resultados deste estudo tem importantes implicac;oes na abordagem terapeutica da D.P.O.C. Referimo-nos a ventilac;ao nao invasiva, que ate ao momenta actual tem sido objecto de con-troversia, nesta entidade clfnica152

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• De facto, em
consonancia com os nossos resultados, a diminuic;ao da contractilidade diafragmatica nos doentes hipercapnicos, associ ada a elevada carga inspirat6ria que estes doentes tem de enfrentar, podera ser o substrato conceptual para a introdur;ao da ventila-r;ao nao invasiva, ap6s a instalac;ao da hipercapnia

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cr6nica. Assim sendo, esta modalidade terapeutica sera iniciada com o objcctivo de assistir a bomba ventilat6ria na eliminar;ao do C02

, nao s6 mediante
ajuda inspirat6ria, como tambem aliviando os mus-culos inspirat6rios, de parte da pesada carga que tcm de enfrentar. Neste ambito, a ventilac;ao niio invasiva, efectuada cminentemente no pet fodo nocturno, per-mitira uma eliminar;iio mais eficaz do C02

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essl.! mesmo perfodo e tambcm uma diminuic;ao con-sidcravel do trabalho respirat6rio

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cliticar;oes, proporcionariio, como consequencia, uma readaptar;ao do comando central da ventilar;ao, com diminuic;ao da drive central que se podcra prolongar para o perfodo diurno, reduzindo assim a sensac;ao de clispneia ou de csforr;o respirat6rio 157

• 0 mecanis-
mo que acabamos de descrever poclcrCt justificar os efeitos bencficos da ventilac;iio niio invasiva, no cs-tudo de Meecham Jones et a/. 157

• Efectivamente nes-
te estudo, constatou-sl.! que, quando doentes com D.P.O.C. eram sujeitos a ventilar;ao nao in vasiva, se assistia a uma melhoria significativa tanto da gasometria arterial diurna, como cia qualidade do sono e da qualidade de vida, comparativamente a quando eram submetidos apenas a oxigenioterapia de tonga clurac;ao.
Relati vamente ao fortalecimento dos musculos respirat6rios, o nosso posicionamento e mais caute-loso. De facto, sea funr;ao destes musculos esta pre-servada, como no caso dos docntes normodpnicos, niio parece razer sentido o seu fortalecimento. Pelo contrario, no caso de fraqueza muscular, importa clis-tinguir a situa<;:ao de fraqucza gcncralizada dos mus-culos esqueleticos, da de fraqueza localizada dos musculos inspirat6rios. No primeiro caso, dado que a fraqueza decorre habitualmente de fen6menos de desnutrir;ao a atitude a tamar devera privilegiar o suporte nutricional ao inves do fortaledmento mus-cular, que poded ate mesmo conduzir a situar;oes pr6ximas do limiar de fadiga. Por ultimo, na situa-r;ao de fraqueza locali zada dos museu los inspirat6rios, como a detectada nos doentes hipercapnicos do nos-so estudo, se a hipercapnia representar um fen6meno adaptativo conferindo protecr;ao a facliga; a questao

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do fortalecimento dos musculos inspirat6rios visan-
do urn aumento da sua contractilidade, poderia in-
verter esse processo de recolocando os
doentes numa de maior vulnerabilidade a
fadiga.
Por todas estas raz6es, afigura-se-nos controver-sa a atitude terapeutica de fortalecimento dos mus-culos respirat6rios, nos doentes com D.P.O.C., ha-vendo necessidade de mais estudos nesta area.

CONCLUSOES

Este estudo demonstrou como principais achados, que:

• A drive respirat6ria central estava aumentada nos doentes com D.P.O.C., independentemente de se-rem normocapni cos ou hipercapnicos.
• A quimiossensibilidade dos ccntros respirat6rios avali ada pela resposta da pressao de oc lusao a com C02 nao revelou entre
ambos os grupos de doentes com D.P.O.C. e tam-bern entre cada urn destes eo grupo controlo, de-notanda inexistencia de na qu imios-sensibilidade do centro respirat6rio.
• A capacidade do di afragma para gerar press6es negativas intratoracicas estava reduzida nos doen-tes com D.P.O.C. grave e de forma particular nos hipercapni cos relativamente aos normocapnicos; nao decorrendo essa exclusivamente da

• Comparando hipercapni cos e nonnocapnicos com identicos graus de estes grupos distinguiam-se relativamente a capacidade dos musculos inspirat6ri os, apenas por uma menor ca-pacidade do diafragma para gerar pressoes negati-vas intratoracicas, denotando fraq ueza localizada deste musculo. Diferiam tambem quanta a reserva de inspirat6ria disponfvel para o acto respi-rat6rio, apresentando os doentes hipercapnicos menor reserva relativa, face as necessidades.
• Os metodos de dos musculos respirat6ri-os dependentes do nao foram sufic iente-

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mente sensfveis para detectar essas
• Ambos os grupos de doentes com D.P.O.C. apre-sentaram uma no rmal dos musculos

expirat6rios, conforme avaliado pela PE , desde max que nao houvesse ponderais signifi cati-vas, rcflcctindo auscncia de fraqueza muscular ge-neralizada.

• Os principais factores preditivos da P"C0 2 em re-pouso foram 0 grau de das vias acreas e a reserva funcio nal em dos musculos inspirat6rios.

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CONTRIBUTO DOS MUSCULOS RESPIRATORIOS PARA A FISIOPATOLOGIA DA HIPERCAPNIA NA DOEN<;A PULMONAR OBSTRUTIVA CRONICA ESTABILIZADA/CRISTINA BARBARA, MIGUEL MOTA CARMO, IOLANDA CORREIA, ROSA SANTOS, ISABEL GON<;ALVES, CAMILA CANTEIRO, ANTONIO RENDAS, RAMIRO A VILA.

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