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# CONHECIMENTOS E PRÁTICAS DE ANESTESIOLOGISTAS SOBRE HIDRATAÇÃO PERIOPERATÓRIA EM PEDIATRIA

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**PALAVRAS-CHAVE:**
Hidratação perioperatória;
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## Resumo

*Introdução:* Existem diversas formas de hidratação perioperatória em pediatria, que se diferenciam pelos tipos de fluidos utilizados e modo de administração. Soluções isotônicas se mostraram superiores às hipotônicas, pois associam-se a menor morbimortalidade. Fórmulas para auxiliar a fluidoterapia em crianças foram criadas e aceitas pela comunidade de anestesistas pediátricos, sendo até hoje muito utilizadas. Não há diretrizes sobre a prescrição ideal de fluidos a ser adotada, o que torna essa prática muito variável, dependendo da experiência e preferência de cada profissional. O objetivo primário do estudo é avaliar o conhecimento e as práticas de condutas na hidratação perioperatória em pediatria adotadas pelos médicos e residentes de anestesiologia no Instituto de Medicina Integral Prof. Fernando Figueira – IMIP.
*Método:* Estudo descritivo de corte transversal. A metodologia escolhida foi a análise das respostas de um questionário dirigido aos médicos anestesiologistas ativos e residentes de anestesiologia da instituição.
*Resultados:* Dos anestesiologistas da instituição 37,7% responderam ao questionário, com uma média de idade de 38 anos, sendo 52,9% do sexo feminino e 44,1% do sexo masculino. 27 deles (79,4%) tiveram treinamento específico em relação a anestesia pediátrica. As soluções mais utilizadas foram Ringer Lactato e Solução Fisiológico 0,9% (SF0,9%). A maioria concordou com os eventos adversos propostos pelo estudo, com destaque para: 30 (90,9%) concordaram que relacionaram acidose hiperclorêmica com SF0,9%, 31 (91,2%) que relacionaram reação anafilática com coloide sintético e 31 (91,2%) que relacionaram hiponatremia com o uso de soluções glicoasadas. 100% dos participantes utilizada a estratégia guiada por metas na administração de fluídos. 61,8% utiliza a fórmula de Holiday e Segar para cálculos de volume.
*Conclusão:* Identificou-se uma concordância entre os conhecimentos e práticas dos anestesiologistas da instituição com o que propõe a literatura. Porém, sugere-se, ainda, o estabelecimento de uma diretriz sobre hidratação perioperatoria em pediatria.

**KEYWORDS**
Hydration;
Pediatrics;
Anesthesiology

**Anesthesiologists' knowledge and practices about perioperative fluid therapy in pediatric patients**

**Abstract**

*Introduction:* There are several forms of perioperative hydration in pediatrics, which differ according to the types of fluids used and the mode of administration. Isotonic solutions proved to be superior to hypotonic ones, as they were associated with lower morbidity and mortality. Formulas to aid fluid therapy in children were created and accepted by the pediatric anesthetist community, and are still widely used today. There are no guidelines regarding the ideal fluid prescription to be adopted, which makes this practice very variable, depending on the experience and preference of each professional. The primary objective of the study is to evaluate the knowledge and practices of perioperative hydration practices in pediatrics adopted by anesthesiologists and residents of anesthesiology at Instituto de Medicina Integral Prof. Fernando Figueira – IMIP**.**

*Methods:* Descriptive cross-sectional study. The chosen methodology was the analysis of responses to a questionnaire addressed to active anesthesiologists and anesthesiology residents at the institution.

*Results:* 37,7% of the institution's anesthesiologists answered the questionnaire, with a mean age of 38 years, with 52.9% female and 44.1% male. 27 of them (79.4%) had specific training regarding pediatric anesthesia. The most used solutions were Lactate Ringer (LR) and 0.9% Saline Solution. Most of them agreed with the adverse events proposed by the study, highlighting: 30 (90.9%) agreed that hyperchloremic acidosis is related to saline solution 0.9%, 31 (91.2%) that anaphylactic reaction is related to synthetic colloid and 31 (91.2%) who related hyponatremia with the use of glucose solutions. 100% of participants used the goal-directed therapy in fluid administration. 61.8% uses the Holiday and Segar formula for volume calculations.

Conclusion: A good concordance was identified between the knowledge and practices of the institution's anesthesiologists and that which studies the literature. However, it is still necessary to establish a guideline on perioperative hydration in pediatrics.

## Introdução

A administração de fluidos durante a anestesia é necessária para controlar o tônus vascular, manter o volume circulante e melhorar o débito cardíaco (DC). Tanto a administração excessiva de líquidos como a desidratação e a hipovolemia podem ser prejudiciais para os pacientes, e assim levar a consequências adversas. [1] Os efeitos adversos potenciais da fluidoterapia excessiva incluem sobrecarga de volume, edema pulmonar, edema tecidual, distúrbios eletrolíticos e ácido-básicos, exacerbação da hemorragia e coagulopatia por hemodiluição.[2] A taxa ideal de administração de fluidos durante a anestesia deve ser adaptada ao *status* volêmico do paciente, bem como à manutenção dos níveis normais de eletrólito sérico e do equilíbrio ácido-básico. O estado volêmico dos pacientes geralmente é avaliado indiretamente por meio de parâmetros que refletem a perfusão, mas as limitações desses métodos não garantem a manutenção adequada do volume em muitas situações. Pressão arterial, débito urinário e frequência cardíaca são parâmetros frequentemente utilizados para estimar a adequação do volume sanguíneo e da resposta à administração de líquidos. [3,4] O conhecimento do conteúdo de cada tipo de fluido é importante quando se planeja um regime apropriado de fluidos perioperatórios. A maioria dos pacientes que necessitam de terapia de manutenção intravenosa deve receber uma combinação de água, sódio, potássio e talvez glicose e outros eletrólitos, em um cristalóide iso-osmolar.[5,6] Em 1957, Holliday e Segar publicaram suas propostas para manejo de fluidos com base no gasto de energia e necessidades de fluidos de acordo com o peso corporal para crianças. A regra "4/2/1" recomenda que 4 mL/kg de solução balanceada, compreendendo uma concentração hipo-osmolar de sódio e glicose, deve ser administrada em crianças de 0 a 10 kg de peso corporal, 2 mL/kg para crianças de 11-20 kg somados a 40 mL e 1 mL/kg por cada kg em excesso 20 kg, somados a 60 mL. [7,8]Mais tarde, os próprios autores consideraram esse tipo de fluido inadequado para reposição perioperatória. O debate sobre a fluidoterapia intraoperatoria ideal para pacientes pediátricos continua até os dias atuais. Há sim uma ampla variabilidade de prática, tanto entre indivíduos quanto instituições em termos do tipo de fluido, o momento de administração e o volume administrado. Esse debate deu origem a três estratégias de manejo de fluidos: a estratégia "liberal", a "restritiva" e a "objetiva". [9] Embora a administração de grande volume de líquidos, como é realizada na estratégia "liberal", possa expandir o conteúdo intravascular e melhorar a perfusão de órgãos, pode também aumentar a incidência de doença cardiopulmonar perioperatoria e complicações na cicatrização de tecidos. [10-12] Por outro lado, restrição de líquidos, como propostana estratégia "restritiva", pode reduzir o tempo de internação, mas pode aumentar os riscos de lesão renal aguda (LRA) no pós-operatório. [13] Já a Terapia direcionada a objetivos (*GoalDirectedTherapy* - GDT), "objetiva", em que a administração individualizada de fluidos baseia-se em metas finais reproduzíveis foi associada a melhores resultados perioperatórios em pacientes de alto risco. [14]

Portanto, observa-se uma alta variabilidade nas práticas de prescrição de fluidos com poucas diretrizes para orientar uma adequada fluidoterapia em crianças durante procedimentos anestésico-cirúrgicos. No presente estudo, pretendeu-se avaliar o conhecimento e a prática dos anestesiologistas sobre hidratação perioperatoria em pediatria.

## Método

Foi realizado um estudo do tipo corte transversal no Instituto de Medicina Integral Prof. Fernando Figueira após a aprovação pelo Comitê de Ética em

Pesquisa em Seres Humanos da instituição (CAAE= 35750620.2.0000. 5201) com anestesiologistas e residentes de anestesiologia, entre julho de 2020 e agosto de 2021, por meio de um questionário estruturado com questões envolvendo respostas simples e múltiplas desenvolvido a partir de diretrizes e artigos a respeito de conhecimentos e práticas sobre hidratação perioperatória em pediatria. Parte do questionário foi construído com base numa escala na qual os entrevistados especificam seu nível de concordância com uma afirmação. Para cada pergunta o entrevistado tinha as seguintes opções: discordo totalmente, discordo, não concordo e nem discordo e concordo. Foi realizada a pré-validação do instrumento (questionário) procedendo-se às seguintes etapas: A validação semântica ou FACE (com juízes não treinados – anestesiologistas especialistas): foram selecionados 05 médicos anestesiologistas com os mesmos critérios de inclusão no estudo, mas que não tomaram parte dele, para de forma presencial opinar sobre o instrumento quanto à: inteligibilidade, aspectos abordados, clareza dos itens, etc.; as sugestões de mudanças no instrumento sugeridas foram incorporadas quando houve consenso entre todos os membros do grupo. Esses especialistas avaliaram também a adequação do conteúdo do instrumento. As modificações sugeridas foram automaticamente incorporadas ao instrumento. Foram incluídos no estudo médicos anestesiologistas e residentes de anestesiologia que trabalham no IMIP. O único critério de exclusão foi ser anestesista sem atuação em sala de cirurgia. Parte dos participantes foram convidados, em seu local de trabalho, a participar da pesquisa. Informava-se ao médico a finalidade da pesquisa e solicitava-se sua colaboração. Após sua aceitação e assinatura do termo de consentimento livre e esclarecido, entregava-se o questionário no início da manhã ou da tarde e era recolhido no fim do turno. Ele era orientado a não fazer pesquisa sobre o tema para responder as perguntas contidas no questionário. O avaliador não ficava presente durante o preenchimento do questionário. Outra parte dos participantes foram contactados através de e-mail para o preenchimento do formulário via GoogleForms, após a aceitação do termo de consentimento, devido a pandemia e a limitação de acesso aos centros cirúrgicos do IMIP. A pesquisa foi realizada após assinatura do Termo de Consentimento Livre e Esclarecido (TCLE), de maneira que foram respeitados as normas e os princípios éticos contidos nas Resoluções 466/2012 e 510/2016 do Conselho Nacional de Saúde e no Código de Ética Médica que regem as pesquisas em seres humanos que tem fins acadêmicos.

## Resultados

Atuam no IMIP cerca de 60 anestesiologistas e 27 residentes de anestesiologia divididos em cinco centros cirúrgicos (geral, pediátrico, obstétrico, ambulatorial e transplante), além do centro de diagnóstico/ imagem e hemodinâmica. Do total, 34 entrevistados participaram da pesquisa, cinco contribuíram com a validação do questionário e 48 se recusaram ou não foram localizados. A média etária dos participantes foi igual a 38 anos (28 a 63). A mediana foi igual a 36 anos. Dos 34 entrevistados, 18 (52,9%) eram do sexo feminino e 15 (44,1%) do masculino e 1 (2,9%) não preencheu esse campo. Com relação a especialização em anestesiologia, 30 (88,2%) eram médicos anestesiologistas e 4 (11,8%) eram residentes de anestesiologia. Deles, 27 (79,4%) responderam sim para treinamento específico em anestesia pediátrica, 6 (17,6%) responderam não, e 1 (2,9%) não respondeu esse campo, Tabela 1. Quando perguntados sobre quais as soluções disponíveis para uso em anestesia pediátrica, as soluções de maior destaque foram Ringer Lactato e Solução fisiológica 0,9%, com 100% e 97% de respostas positivas, respectivamente, como mostrado na tabela 2. Essas soluções também foram as mais

utilizadas pelos participantes na hidratação perioperatória em pediatria, com 33 (97,1%) concordando com o uso de Ringer Lactato e 28 (82,4%) concordando com o uso de Solução Fisiológica 0,9%. Dentre as soluções menos utilizadas, se destacaram Dextrans (20,6% discordaram totalmente e 38,2% discordaram) e Gelatina (20,6% discordaram totalmente e 38,2% discordaram), Tabela 3. Com relação aos eventos adversos relacionados ao Ringer Lactato, ‘‘edema periférico” foi o mais lembrado (76,5% concordaram). Por outro lado, o evento ‘‘hipercoagulabilidade” obteve os resultados de menor concordância (20,6%). Sobre os eventos adversos relacionados a soluções balanceadas, os entrevistados responderam de forma semelhante aos eventos adversos relacionados ao uso de Ringer Lactato, com edema periférico sendo o de maior concordância (70,6% concordaram), seguido de edema pulmonar (58,8% concordaram) e, por último, hipercoagulabilidade (38,2% de concordância). Já com relação aos eventos adversos relacionados ao uso de solução Fisiológica 0,9%, observou-se uma maior concordância com “acidose hiperclorêmica” (97,1% concordaram). Chamou atenção os 61,8% que concordaram com “retenção de fluidos”. Dos 34 participantes, 88,2% concordaram que as soluções balanceadas têm menor chance de causar acidose em relação a solução fisiológico 0,9%. E, 100% desses concordaram que grandes volumes de cristaloides podem causar acidose. Quando perguntados com relação aos eventos adversos dos coloides sintéticos, reação anafilática obteve resultados mais concordantes (91,2%), assim como coagulopatia (85,3%) e insuficiência renal (82,4%). Com relação aos eventos adversos relacionados a albumina, reação anafilática foi o evento com respostas mais concordantes (76,5%). Já com relação ao uso de soluções glicosadas, os eventos adversos questionados obtiveram alta concordância, com 91,2% concordando com hiponatremia, 88,2% com hiperglicemia e 79,4% com dano cerebral. Tabelas 4 e 5. Quando questionados sobre as estratégias de fluidoterapia utilizadas na rotina (restritiva, liberal e guiada por metas), a guiada por metas obteve 100% de concordância. Com relação a estratégia restritiva, 94,1% dos participantes concordaram que lesão renal aguda é um de seus eventos adversos. Já na estratégia liberal, o evento adverso que mais chamou atenção foi “descompensação cardiopulmonar”, com 100% concordando. Sobre as fórmulas para cálculo de volume de reposição, 73,5% concordaram que conheciam a fórmula de Holliday e Segar (4/2/1), 58,8% concordaram que conheciam a fórmula de Furman e 41,2% concordaram que conheciam a fórmula de Berry. Dentre essas, a mais utilizada pelos participantes na prática clínica foi a fórmula de Holliday e Segar (61,8% concordaram). Dentre os 34 participantes da pesquisa, 100% concordaram sobre a necessidade de uma diretriz para fluidoterapia perioperatória em pediatria, Tabela 6.

## Discussão

Este estudo avaliou os conhecimentos e práticas dos anestesiologistas de uma única instituição sobre hidratação perioperatória em pediatria. A hidratação perioperatória tem como objetivos manter as necessidades metabólicas basais, compensar déficits gerados pelo jejum pré-operatório e repor perdas relacionadas com o trauma cirúrgico, oferecendo o volume de fluidos necessário para manter a perfusão tecidual. [15] Assim, é imprescindível que todos os profissionais envolvidos na administração de fluidos estejam preparados para realizá-la com as soluções e volumes adequados, e que reconheçam os seus possíveis eventos adversos. A reposição de líquidos deve ser planejada com base na transferência de líquidos entre o compartimento extracelular e o espaço intersticial que resulta no volume chamado terceiro

espaço. Essa transferência pode ser diminuída se a reposição de volume intravascular for realizada com soluções de osmolaridade semelhantes à do líquido extracelular.

Neste estudo observou-se que as soluções de maior destaque na prática da anestesia perioperatória em pediatria foram Ringer Lactato (97,1%) e Solução Fisiológica 0,9% (82,4%), seguidas de Solução glicosilada 1%, solução fisiológica 0,9% + solução glicosilada 4%, solução glicosilada 2,4%, solução glicosilada 4%, albumina, gelatina, amido e dextrans. Quando comparamos com um estudo realizado na Inglaterra[16], as mais utilizadas foram Solução Fisiológica 0,18%, Solução Glicosilada 4%, Ringer Lactato e Solução Fisiológica 0,9%, mostrando que, apesar da variabilidade, seguem o mesmo padrão.

Na prática clínica, a solução cristaloide mais utilizada é o Ringer Lactato. Quando comparado com o fluido extracelular, é ligeiramente hipotônico. O soro fisiológico tem osmolaridade praticamente igual à do fluido extracelular, porém, sua alta concentração de cloreto pode levar à acidose hiperclorêmica se utilizado em grandes volumes.[17] Em nosso estudo, observamos que os participantes concordam que os principais eventos adversos relacionados ao uso de Ringer Lactato foram edema periférico, edema pulmonar e hipercoagulabilidade, o que pode ser explicado pelo fato de ser uma solução ligeiramente hipotônica. Já com relação aos efeitos adversos relacionados ao Soro Fisiológico 0,9%, a maioria dos participantes deste estudo concordou que a acidose hiperclorêmica, retenção de fluidos e estados hiperosmolares são os mais frequentes. Além disso, 100% dos participantes concordaram que grandes volumes de cristaloides podem causar acidose, corroborando com essa afirmação, e 88,2% concordaram que o Ringer Lactato tem menor chance de causar acidose em relação a Solução Fisiológica 0,9%.

Já os coloides são soluções gelatinosas que contêm partículas muito grandes para passarem pela membrana semipermeável, permanecendo no compartimento intravascular por mais tempo. Os coloides também aumentam o volume intravascular, aumentando, assim, a pressão oncótica intravascular. São divididos em dois grupos: coloides naturais e coloides sintéticos.[18] A albumina é um coloide natural altamente solúvel em água, que constitui 60% da proteína total no plasma. É improvável que a administração de albumina cause efeitos colaterais porque é um coloide de ocorrência natural. [19] As reações alérgicas podem ocorrer, embora aqueles vistos com a albumina sejam menos comuns do que com outros coloides. A interrupção da cascata de coagulação pode ocorrer devido aos efeitos na agregação plaquetária e ativação da antitrombina III. [20] Apesar desses raros efeitos colaterais, a albumina tem sido considerada o coloide padrão ouro para pacientes pediátricos. No presente estudo, 38,2% dos entrevistados são favoráveis ao uso de albumina. Com relação aos efeitos adversos, apesar de rara, a maioria reconhece a reação anafilática como evento adverso possível (76,5% de concordância), seguido de insuficiência renal (52,9% de concordância) e coagulopatia (44,1% de concordância).

No caso dos coloides sintéticos, os dextranos tem como principais vantagens um volume aumentado de expansão em comparação com a albumina e também a melhora da microcirculação. [19] Apesar do excelente efeito coloidosmótico, os dextranos têm alguns efeitos indesejáveis, como reações anafiláticas, hipocoagulabilidade e efeitos renais. Gelatinas, outra opção de coloide sintético, são polipeptídeos formados pela degradação do tecido conjuntivo animal, que têm um efeito oncótico inferior e mais curto quando comparado às soluções da mesma classe. Como outros coloides, há um efeito negativo na coagulação. [19.21] No presente estudo, a maioria dos participantes concordou que os principais efeitos adversos relacionados ao uso de coloides sintéticos

são reação anafilática (91,2%), coagulopatia (85,3%) e insuficiência renal (82,4%). Apenas os amidos de baixo peso molecular são liberados para uso em crianças no Brasil.

Desarranjos metabólicos relacionados ao jejum pré-operatório prolongado para crianças pequenas podem causar hipoglicemia, lipólise e cetoacidose. A glicose é a principal fonte de energia para o cérebro.[22] Sendo assim, as soluções glicosadas são bastante utilizadas na prática clínica, com o intuito de prevenir esses danos. As soluções de glicose não devem ser administradas como uma solução de substituição para perdas extraordinárias (sangramento, terceiro espaço, vômito, p.ex.) porque são soluções hipotônicas que produzem hiperglicemia e hiponatremia dilucional. [23-26] Em sua maioria, os participantes concordaram que o uso inadequado das soluções glicosadas pode acarretar efeitos indesejados, como os já citados anteriormente, hiperglicemia (88,2%), hiponatremia (91,2%) e, consequentemente, dano cerebral (79,4%).

Há uma ampla variabilidade de prática, tanto entre os indivíduos quanto instituições em termos do tipo de fluido usado, o momento de administração e o volume administrado. Na última década, esse debate deu origem a três estratégias de fluidoterapia: a "liberal", "restritiva" e "guiada por metas". [27] Embora a administração de grande volume de fluidos (estratégia liberal) possa expandir o espaço intravascular e melhorar a perfusão do órgão, [28] pode também aumentar a incidência de complicações cardiopulmonares e problemas de cicatrização de tecidos. [29,30] Por outro lado, a restrição de fluidos (estratégia restritiva) pode reduzir o tempo de internação; no entanto, pode aumentar o risco de lesão renal aguda (LRA) no pós-operatório. [31] A terapia guiada por metas (TGM), em que a administração de fluidos é individualizada com base em objetivos finais reproduzíveis, foi associada a melhores resultados perioperatórios. [32] No estudo atual, quando questionados sobre as estratégias de fluidoterapia utilizadas, os entrevistados demonstraram 100% de concordância quanto a terapia guiada por metas, 38,2% quanto a estratégia restritiva e 17,6% quanto a liberal. Além disso, 94,1% concordaram que lesão renal aguda é um dos efeitos adversos da estratégia restritiva. Com relação aos efeitos adversos da estratégia liberal, 100% concordou com descompensação cardiopulmonar e 85,3% com complicações de cicatrização tecidual.

O volume e a composição da fluidoterapia perioperatória são baseados no *status* pré-operatório do paciente, no tipo de procedimento a ser realizado, e no tempo na sala de cirurgia e de recuperação estimado. A fórmula de Holliday e Segar's[33] permanece a mais comumente usada para calcular o volume de manutenção de fluidos perioperatórios em pediatria. [23, 33, 34] Os déficits de fluidos em jejum são calculados pelo número de horas para as quais os fluidos são restritos com a necessidade de fluido de manutenção. Em 1975, Furman et al. propôs substituir 50% de déficit hídrico em jejum na primeira hora e 25% na segunda e terceira horas. Essas diretrizes foram ainda simplificadas para pacientes com trauma por Berry et al. [35] Observamos que, 73,5% dos participantes concordaram que conheciam a fórmula de Holiday e Segar e 61,8% concordaram fazer o uso da mesma, 58,8% conheciam a fórmula de Furman e 41,2% a fórmula de Berry.

Como limitações deste estudo, reconhecemos o número reduzido de participantes, 34, o que pode ser explicado devido as limitações impostas pela pandemia de COVID-19 ao longo do período de coleta de dados, que limitou acessos a blocos cirúrgicos, cirurgias eletivas e, nos obrigou a realizar questionários no meio virtual, resultando em baixa adesão por parte dos anestesistas. Porém, esse número representa mais de 30% dos anestesiologistas da instituição, o que

acreditamos ser uma boa representatividade da população.

Dessa forma, conclui-se que a maioria dos anestesiologistas participantes do estudo demonstrou conhecimentos e práticas sobre hidratação perioperatória em pediatria alinhados com o que a literatura propõe sobre o assunto. Entretanto, foi possível constatar algumas divergências, o que corrobora à necessidade de uma diretriz para fluidoterapia perioperatória em crianças.

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**Tabela 1 –**

| Variáveis | n | % |
|---|---|---|
| **Sexo** | | |
| Feminino | 18 | 54,5 |
| Masculino | 15 | 45,5 |
| **Atuação atual** | | |
| Residente de anestesiologia | 4 | 11,8 |
| Médico anestesiologista | 30 | 88,2 |
| **Treinamento específico em relação a anestesia em pediatria** | | |
| Sim | 27 | 81,8 |
| Não | 6 | 18,2 |
| **Na instituição em que você trabalha, há um protocolo para administração de fluidos no perioperatorio** | | |
| Sim | 5 | 14,7 |
| Não | 29 | 85,3 |
| **Você acha necessária uma diretriz para fluidoterapiaperioperatoria em crianças** | | |
| Sim | 34 | 100,0 |
| Não | 0 | 0,0 |

| | Média ± DP | Mediana (Q1; Q3) | Mínimo – Máximo |
|---|---|---|---|
| Idade (anos) | 38,0 ± 8,4 | 36,0 (31,3; 40,8) | 28,0 – 63,0 |

**Tabela 2 – Soluções disponíveis no serviço**

| Variáveis | n | % |
|---|---|---|
| **Soluções disponíveis** | | |
| Ringer lactato | 34 | 100,0 |
| Solução balanceada | 8 | 23,5 |
| Solução fisiológica 0.9% | 33 | 97,1 |
| Solução glicosada | 31 | 91,2 |
| Albumina | 18 | 52,9 |
| Gelatina | 4 | 11,8 |
| Amidos | 7 | 20,6 |
| Dextrans | 5 | 14,7 |

**Tabela 3 – Soluções utilizadas na hidratação perioperatoria de pacientes pediátricos.**

| Solução que utilizaria na hidratação perioperatoria de pacientes pediátricos | Discordo totalmente | Discordo | Não concordo nem discordo | Concordo |
|---|---|---|---|---|
| | n (%) | n (%) | n (%) | n (%) |
| Solução fisiológica | 2 (5,9) | 1 (2,9) | 3 (8,8) | 28 (82,4) |

| | | | | |
|---|---|---|---|---|
| 0,9% | | | | |
| Soluções glicosadas | 9 (26,5) | 13 (38,2) | 5 (14,7) | 7 (20,6) |
| Solução glicosilada 1% | 5 (14,7) | 7 (20,6) | 10 (29,4) | 12 (35,3) |
| Solução glicosilada 2,4% | 8 (24,2) | 7 (21,2) | 13 (39,4) | 5 (15,2) |
| Solução glicosilada 4% | 7 (20,6) | 12 (35,3) | 10 (29,4) | 5 (14,7) |
| Solução glicofisiológica (SF0,9% + SG4%) nas mesmas proporções | 7 (24,1) | 8 (27,6) | 6 (20,7) | 8 (27,6) |
| Ringer lactato | 0 (0,0) | 0 (0,0) | 1 (2,9) | 33 (97,1) |
| Albumina | 2 (6,9) | 8 (27,6) | 6 (20,7) | 13 (44,8) |
| Amido | 9 (26,5) | 13 (38,2) | 9 (26,5) | 3 ( 8,8) |
| Gelatina | 7 (24,1) | 13 (44,9) | 6 (20,7) | 3 (10,3) |
| Dextrans | 11 (32,4) | 15 (44,1) | 6 (17,6) | 2 (5,9) |

**Tabela 4 – Eventos adversos**

| Variáveis | Discordo totalmente | Discordo | Não concordo nem discordo | Concordo |
|---|---|---|---|---|
| | n (%) | n (%) | n (%) | n (%) |
| **Eventos adversos relacionados ao Ringer Lactato** | | | | |
| Edema periférico | 0 (0,0) | 5 (14,7) | 3 (8,8) | 26 (76,5) |
| Edema pulmonar | 2 (5,9) | 3 (8,8) | 6 (17,6) | 23 (67,6) |
| Hipercoagulabilidade | 9 (26,5) | 14 (41,1) | 4 (11,8) | 7 (20,6) |
| **Eventos adversos do SF 0,9%** | | | | |
| Acidose hiperclorêmica | 0 (0,0) | 1 (3,0) | 2 (6,1) | 30 (90,9) |
| Estados hiperosmolares | 2 (5,9) | 11 (32,4) | 2 (5,9) | 19 (55,8) |
| Retenção de fluidos | 3 (8,8) | 8 (23,5) | 2 (5,9) | 21 (61,8) |
| **As soluções Balanceadas tem menor chance de causar acidose em relação ao Soro Fisiológico 0,9%.** | 0 (0,0) | 0 (0,0) | 4 (11,8) | 30 (88,2) |
| **Grandes volumes de cristaloides podem causar acidose** | 0 (0,0) | 0 (0,0) | 0 (0,0) | 34 (100,0) |

**Tabela 5 – Eventos adversos**

| Variáveis | Discordo | Discordo | Não | Concordo |
|---|---|---|---|---|

| | totalmente | | concordo nem discordo | |
|---|---|---|---|---|
| | n (%) | n (%) | n (%) | n (%) |
| **São eventos adversos dos colides sintéticos** | | | | |
| Reação anafilática | 1 (2,9) | 2 (5,9) | 0 (0,0) | 31 (91,2) |
| Coagulopatia | 1 (2,9) | 1 (2,9) | 3 (8,8) | 29 (85,4) |
| Insuficiência renal | 0 (0,0) | 4 (11,8) | 2 (5,9) | 28 (82,4) |
| **São eventos adversos da albumina** | | | | |
| Reação anafilática. | 3 (9,1) | 4 (12,1) | 0 (0,0) | 26 (78,8) |
| Coagulopatia | 3 (9,4) | 10 (31,3) | 4 (12,5) | 15 (46,8) |
| Insuficiência renal. | 1 (3,1) | 9 (28,1) | 4 (12,5) | 18 (56,3) |
| **São eventos adversos das Soluções Glicosadas** | | | | |
| Hiponatremia | 0 (0,0) | 1 (2,9) | 2 (5,9) | 31 (91,2) |
| Hiperglicemia | 0 (0,0) | 4 (11,8) | 0 (0,0) | 30 (88,2) |
| Dano cerebral | 0 (0,0) | 4 (11,8) | 3 (8,8) | 27 (79,4) |

**Tabela 6– Volumes**

| Variáveis | Discordo totalmente | Discordo | Não concordo nem discordo | Concordo |
|---|---|---|---|---|
| | n (%) | n (%) | n (%) | n (%) |
| **Na sua rotina, você utiliza** | | | | |
| Estratégia restritiva | 2 (5,9) | 13 (38,2) | 6 (17,7) | 13 (38,2) |
| Estratégia liberal | 2 (6,1) | 17 (51,5) | 8 (24,2) | 6 (18,2) |
| Guiada por metas | 0 (0,0) | 0 (0,0) | 0 (0,0) | 34 (100,0) |
| **São eventos adversos da estratégia Restritiva** | | | | |
| Lesão renal aguda | 0 (0,0) | 0 (0,0) | 1 (2,9) | 32 (94,1) |
| **São eventos adversos da estratégia Liberal** | | | | |
| Descompensação cardiopulmonar | 0 (0,0) | 0 (0,0) | 0 (0,0) | 34 (100,0) |
| Complicações de cicatrização tecidual | 0 (0,0) | 2 (5,9) | 3 (8,8) | 29 (85,3) |
| **Conhece a fórmula de Holliday e Segar (4/2/1) para cálculo do volume de reposição** | 3 (8,8) | 0 (0,0) | 6 (17,6) | 25 (73,5) |
| **Conhece a fórmula de Furman (4mL/kg/ hora de jejum dividido nas 2 primeiras horas) para cálculo do volume de** | 3 (8,8) | 6 (17,6) | 5 (14,7) | 20 (58,8) |

| | | | | |
|---|---|---|---|---|
| **reposição** | | | | |
| **Conhece a fórmula de Berry (25 mL/kg para menores de 3 anos, 15 mL/Kg para maiores de 3 anos, manutenção 4mL/kg + reposição do porte cirúrgico 2/4/6) para cálculo do volume de reposição** | 4 (12,1) | 8 (24,2) | 7 (21,2) | 14 (42,5) |
| **Métodos descritos você utiliza atualmente** | | | | |
| Holliday e Segar | 3 (8,8) | 5 (14,7) | 5 (14,7) | 21 (61,8) |
| Furman | 3 (8,8) | 9 (26,5) | 13 (38,2) | 9 (26,5) |
| Berry | 4 (11,8) | 9 (26,5) | 12 (35,2) | 9 (26,5) |

# BRAZILIAN JOURNAL OF ANESTHESIOLOGY

Official Publication of the Brazilian Society of Anesthesiology
Incorporating *Revista Brasileira de Anestesiologia* (ISSN 0034-7094) as of 2021.


**AUTHOR INFORMATION PACK**

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The *Brazilian Journal of Anesthesiology* (BJAN) is the official journal of the Brazilian Anesthesiology Society.

The BJAN publishes original work in all areas of anesthesia, surgery, critical care, perioperative medicine, and pain medicine, including basic, translational, and clinical research, as well as education and technological innovation.

The journal welcomes manuscripts in the following formats: Original investigation Review Case report Letter to the editor Short communication Clinical image

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The Brazilian Journal of Anesthesiology **(BJAN)** is the official journal of the Brazilian Society of Anesthesiology (Sociedade Brasileira de Anestesiologia, SBA), which supports the journal completely - the cost of publishing is on behalf of the SBA, **with no charges to authors.**

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