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Clinical Importance of Peritoneal Pressure Dialysis

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Abstract

During peritoneal dialysis, measuring intraperitoneal pressure is easy and has clear therapeutic benefits. Adult peritoneal dialysis machines, however, hardly ever measure it. This review's objective is to raise awareness of the importance of measuring intraperitoneal pressure. This measurement is performed with the patient supine before beginning the manual exchange with the "Y" system drain. The patient's liquid column height is measured from the mid-axillary line while the drain bag is raised. With typical ranges of 10 to 16 cmH_2O, intraperitoneal pressure should never exceed 18 cmH_2O. It increases the intraperitoneal volume by 1-3 cmH_2O/L at basal values that fluctuate with posture, physical activity, and body mass index.

Keywords: Cancer treatment • drug delivery • Clinical importance

Introduction

The infusion volume is chosen for paediatric peritoneal dialysis (PD) based on objective standards that take the size or intraperitoneal pressure into consideration (IPP). Adult-specific recommendations are not included in the guidelines, and the infusion volume prescribed is frequently determined by the patient's size, weight, and body surface without taking the IPP into account. In any case, the volume infused increases the IPP, which is thought to be a factor in some mechanical difficulties and may cause discomfort, satiety, sleep disturbances, hemodynamic and respiratory changes, among other things (leakage, hernia, etc.). Less is known about how IPP affects the efficiency of dialysis, primarily through a reduction in ultrafiltration (UF), and this is the aspect that we would like to look at.

Literature Review

IPP in PD is assessed using noninvasive techniques. The simplest and safest method, developed by Durand in 19926, measures the IPP in the filled abdomen before drainage. The patient should be relaxed, horizontally on their back, with their head supported, to avoid pressure on the abdomen.

The catheter connection is then opened as the liquid column rises to a level where it stabilises with a respiratory oscillation of 1-2 cmH_2O, ensuring an accurate measurement (in systems with wheels, stay-safe type, it is aligned to the drainage position). The midpoint of the oscillation, measured in cm of H_2O, will be used to calculate the IPP.

A mid-axillary IPP of 10–16 cmH_2O on stable adult PD patients receiving 2 L of dialysate is regarded as acceptable. A reading above 18 cmH2O should be avoided because it is linked to symptoms. The umbilicus or other sites have been used as the point zero by several authors [1-4].

Low IPP readings might make it possible to enhance intraperitoneal volume (IPV), which would raise clearance capacity. However, even with readings in the low portion of the normal range, IPP has an impact on the effectiveness of PD. Patients who have low tolerance for PD, Kt/V, and UF in the limit may benefit from lower IPP values.

IPP in children typically ranges from 5 to 15 cmH_2O and up to 18 cmH_2O, just like in adults, albeit personal tolerance must be taken into account with a large individual variance that is linked to a more varied body mass index (BMI). The primary component influencing IPP is IPV, which is the sum of previous residual volume, volume injected, and UF volume. It rises from 1 to 3 cm of water per litre (on average 2.2 cm), above the vacuum IPP. 16 Since each patient's increase is fairly consistent, it is possible to estimate future changes in IPP for further volumes in the same patient using an IPP measurement with a known IPV [5]. This consistent increase in IPP with IPV in the same patient stands in stark contrast to the significant interpatient IPP variation, which can range from more than 10 cmH_2O in some individuals with a given IPV to more than 6 L in other patients with the same IPP.

IPP and BMI (weight/height2) have a strong relationship in both children and adults.Therefore, a higher IPP is linked to more obesity. The interindividual variance in BMI would primarily explain the diversity of IPP in children21 and adults due to this correlation's strength (unpublished own data). Some writers fail to notice this association.

Effects of elevated intraperitoneal pressure

Elevated IPP in PD patients increases morbidity, death, and the requirement for hemodialysis as a result of the PD approach failing. A gradual increase in IPP at rest may result in an abrupt drop in respiratory indices, and in this case, patients may experience malaise, back or abdominal pain, shallow breathing, and sleep difficulties, including sleep apnea. In patients using APD, these symptoms become more pronounced and more severe when they are decubitus [6].

Increased IPP is associated with mechanical problems of PD, such as hydrothorax, hernia, leakage, peritoneal-vaginal hydrocele, genital edoema, gastric reflux, haemorrhoids, etc. Hernias have been demonstrated to occur more frequently in PD than in hemodialysis and more frequently in CAPD than in APD, particularly when basal IPPs are above 20 cmH_2O, albeit hernias are not necessarily linked to higher basal IPPs.

Because PD has a lower UF capacity than hemodialysis, PD patients tend to overhydrate more frequently, which raises their risk of morbidity and mortality and is a major factor in why they switch to hemodialysis. The ability to ultrafilter is a more accurate indicator of how well a treatment is working than solute removal [7].

Since 1981, it has been understood that the reabsorption of the peritoneal fluid is what causes the drop in net UF that happens during the prolonged exchanges of PD. In 1983, it was demonstrated that this resorption was proportional to an increase in IPP37, and Durand warned in 1992 that in people

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with PD, an increase in IPP within the normal range of 8 to 18 cmH_2O resulted in a proportionately lower UF volume reached with 3.86% glucose solution.

In any case, the IPP-induced infiltration of fluid into the peritoneal interstitium results in edoema and a corresponding drop in interstitial oncotic pressure, which raises the colloid-osmotic transcapillary gradient—another Starling force that boosts fluid recruitment through capillaries.

Conclusion

IPP measurement is easy and risk-free, and it aids in improving PD prescription, monitoring, and assessment of sufficient IPV that reduces UF and avoids mechanical difficulties. Elevated IPP is a reason of UF failure that can be quickly determined or excluded.

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Conflict of interest

There are no conflicts of interest by author.

References

1. Lameire, Norbert and Wim Van Biesen. "Importance of blood pressure and volume control in peritoneal dialysis patients." *Perit Dial Int* 21 (2001): 206-213.
2. Krane, N. Kevin. "Intracranial pressure measurement in a patient undergoing hemodialysis and peritoneal dialysis." *Am J Kidney Dis* 13 (1989): 336-339.
3. Tonbul, Z., L. Altintepe, C. Sözlü and M. Yeksan, et al. "Ambulatory blood pressure monitoring in haemodialysis and continuous ambulatory peritoneal dialysis (CAPD) patients." *J Hum Hypertens* 16 (2002): 585-589.
4. Scanziani, Renzo, Beatrice Dozio, Ivano Baragetti and Serena Maroni. "Intraperitoneal hydrostatic pressure and flow characteristics of peritoneal catheters in automated peritoneal dialysis." *Nephrol Dial Transplant* 18 (2003): 2391-2398.
5. Ataş, Nuh, Yasemin Erten, Gülay Ulusal Okyay and Salih Inal, et al. "Left ventricular hypertrophy and blood pressure control in automated and continuous ambulatory peritoneal dialysis patients." *Ther Apher Dial* 18 (2014): 297-304.
6. Jang, Jong Soon, Soon Kil Kwon and Hye-Young Kim. "Comparison of blood pressure control and left ventricular hypertrophy in patients on continuous ambulatory peritoneal dialysis (CAPD) and automated peritoneal dialysis (APD)." *Electrolyte Blood Press* 9 (2011): 16.
7. Sav, Tansu, Oktay Oymak, Mehmet Tugrul Inanc and Ali Dogan, et al. "Effects of twice-daily icodextrin administration on blood pressure and left ventricular mass in patients on continuous ambulatory peritoneal dialysis." *Perit Dial Int* 29 (2009): 443-449.

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