# Different proportions of crystal colloid hemodynamic in cesarean section

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**Abstract: Objective** Explore the cesarean section during surgery, the application of crystalloid and colloid ratio of 1:1, 1:2, 1:3 mixture of pre-expansion impact on maternal hemodynamics. **Methods** From patient admitted in hospital from March 2010 to March 2012, 300 cases of maternal, Group were randomly divided into 1:1, 1:2, 1:3, group Comparison between the three groups of patients intraoperative hemodynamic data differences. **Results** 10 minutes during surgery, The end of the surgery process maternal HR increased, MAP were lower, but the 1:3 group than in the other two groups, HR increased, The MAP reduction are smaller, Vasopressors shorter time, Vasopressor dose less, The statistical difference was statistically significant (P <0.01). **Conclusion** Cesarean section during surgery, 1:3 milk Ringer solution, hydroxyethyl starch injection ratio by maternal heart rate, blood pressure and other hemodynamic lighter, and reduce the course of treatment vasopressorsthe use of time and dose. **[**Yu Ma, Guorong Li, Xiaohua Luo, Jian Liu, Sufeng Shen. **Different proportions of crystal colloid hemodynamic in cesarean section.** *Life Sci J* 2013;10(2):1660-1662**]. (**ISSN:1097-8135**).** http://www.lifesciencesite.com. 231

**Keywords:** crystal; colloid; expansion; hypotension

Development of cesarean section anesthesia, by simple spinal anesthesia, epidural anesthesia to the more commonly used spinal-epidural anesthesia the the spider film block associated with epidural anesthesia (CSEA), due to the latter from the rapid onset of analgesiamuscle relaxant effect, widely used in cesarean section, but often leads to hypotension in the course of treatment, are now in our hospital 300 cases of cesarean section clinical data to explore in the cesarean section during surgery, the application ofthe crystal gel ratio of 1:1, 1:2, 1:3 mixture of pre-expansion of maternal hemodynamics.

## 1. Information and intervention

**1.1 Clinical data:** Select admitted to our hospital from March 2010 to March 2012, 300 cases of maternal cesarean section were randomly divided into 1:1, 1:2, 1:3 group, three groupspatients generally the difference was not statistically significant (P> 0.05) (Table 1).

Table 1.the two groups were compared to the general situation

| Grouping | The number of cases | Average age (Years) | The average gestational age (Weeks) | Surgery often (H) | Motherhood Category | |
|---|---|---|---|---|---|---|
| | | | | | Primipara | multiipara |
| 1:1 Group | 100 | 22.9±6.52 | 38.2±2.1 | 1.98±0.22 | 66 | 34 |
| 1:2 Group | 100 | 23.1±5.51 | 38.1±2.2 | 2.11±0.21 | 64 | 36 |
| 1:3 Group | 100 | 23.5±3.86 | 38.5±1.9 | 1.92±0.23 | 65 | 35 |
| χ2/t | | 0.15 | 0.35 | 1.78 | 0.39 | |
| p | | 0.88 | 0. 46 | 0.08 | 0.53 | |

1.2 **Methods:** All enrolled maternal cesarean section, anesthesia selection CSEA, in the pre-expansion underwent general anesthesia process, the crystal is used for milk Ringer's solution, the colloid used hydroxyethyl starch injection fluid, expansion of the total amount of liquid500ml, 1:1 liquid formulations of milk Ringer's solution: 1 hydroxyethyl starch injection; the 1:2 3 milk Ringer: 2-hydroxyethyl starch injection; 1:33 milk Ringer's solution: hydroxyethyl starch injection.

1.3 **Evaluation index**: in the process were recorded in the three groups of patients before anesthesia, 10 minutes, and the end of the surgery process, heart rate (HR), mean arterial pressure (MAP), intraoperative vasopressor use long, vasopressor dose.

1.4 **Statistical Methods:** SPSS16.0 statistical software, measurement data t test, count column chi-square test, p <0.05 was considered statistically significant.

## 2 Results

2.1 three groups of maternal HR, MAP case: 3 maternal anesthesia before the start of HR, MAP was no significant difference in surgery for 10 minutes, the end of the surgery process, the three groups of maternal HR appear to rise, MAP decreased, but1:3 group than

in the other two groups, HR increased, the MAP reduction are small, statistical P <0.01. Table 2.

Table 2. Maternal HR (beats / min), MAP (mmHg) compared to the situation

| Grouping | The number of cases | Before anesthesia | | Surgery in 10 minutes | | The end of the surgery process | |
|---|---|---|---|---|---|---|---|
| | | HR | MAP | HR | MAP | HR | MAP |
| 1:1 Group | 100 | 62.1±15.6 | 69.1±11.1 | 89.1±12.1 | 51.1±13.1 | 76.3±15.2 | 60.1±10.1 |
| 1:2 Group | 100 | 63.1±16.2 | 70.1±11.2 | 72.3±13.4 | 52.1±11.2 | 69.5±17.5 | 63.1±9.2 |
| 1:3 Group | 100 | 62.8±16.5 | 69.8±12.5 | 65.4±20.5 | 62.8±8.5 | 65.4±20.5 | 65.8±5.5 |
| F | | 0.10 | 0.19 | 59.73 | 34.17 | 9.49 | 11.24 |
| p | | 0.90 | 0.82 | <0.01 | <0.01 | <0.01 | <0.01 |

2.2 The three groups were between the intraoperative use of vasopressors, vasopressor dose compared to the situation: three groups of maternal, 1:3 vasopressors shorter than the other two groups maternal use of vasopressor dose lessThe statistics P less than 0.01. Table 3.

Table 3. Groups were between the intraoperative use of vasopressors, use of vasopressor dose

| Grouping | The number of cases | Intraoperative vasopressor use (minutes) | The use of vasopressor dose (ml) |
|---|---|---|---|
| 1:1 Group | 100 | 30.5±10.3 | 18.8±9.2 |
| 1:2 Group | 100 | 25.1±9.2 | 15.1±7.2 |
| 1:3 Group | 100 | 20.8±5.2 | 10.5±5.3 |
| t | | 32.54 | 31.52 |
| p | | <0.01 | <0.01 |

**3 Discussion**

Cesarean section line CSEA blood pressure decrease was mainly due to: ① spinal anesthesia on sympathetic block, the block area, the rapid expansion of blood vessels, leading to blood stagnation in the veins, small blood vessels, so the effort a sharp reduction of the amount of loop effective blood volume showed a relative reduction; ② supine syndrome occurs due to the huge uterus on the inferior vena cava compression, prompting the vein of Rhodobryum gradually decrease in maternal, in the CESA effect play, progressive muscle relaxation, the uterus temporarily lose abdominal support care, more complete oppression of the uterus on the inferior vena cava, the incidence of hypotension is difficult to avoid. Rapid decline in maternal blood pressure on organ blood for greater impact, the most maternal brief hypotension exists the risk of damage to the fetus, placenta perfusion resulting decrease in umbilical blood flow rapid decrease in fetal acidosis, intrauterine missing oxygen and even nerve damage has been reported before CSEA recommended expansion to reduce the incidence of hypotension [1].

Clinical infusion liquid to maintain the cycle of effective blood volume in the body, can produce different clinical effects of different types of liquid infusion [2], hemodynamic stability after anesthesia clinical usually maintained through the pre-expansion, butwhich liquid infusion more reasonable, there are still significant controversy [3]. Before the start of the anesthetic maternal HR, MAP had no significant difference in surgery for 10 minutes, the end of the surgery process, the three groups of maternal HR appear to rise, MAP decreased, but the 1:3 group than in the other two groups, HR increased , MAP decreased small crystal Description: colloid ratio selection 1:3, more satisfied as the expansion of the clinical effects of pre-filled. According to research reports [4]: 75% of the infusion of liquid crystals faster spread to the cells, interstitial, in the spinal anesthesia instantly crystalloid fluid infusion, 10min 40% retention in the blood vessels, 30min30% in the blood vessels memory left. excessive input crystal, the effective circulating blood volume cannot replenish. Colloid reported [5], the expansion of blood volume effect, 10min vascular memory remain 100% satisfactory prevention of hypotension effect.

In this group, the proportion of the selection process, the author highlights the colloid-based formulations set, the incidence Shuinazhuliu mothers during pregnancy is extremely common, the protein concentration in the plasma is often reduced expression change, the body of the colloidalosmotic pressure showed decreasing trend, foreign research suggest that [6]: given a large number of liquid crystal input, hematocrit decreased to 20%, plasma colloid osmotic pressure decreased significantly induce and aggravate edema within the organization the possibility of a dramatic rise inespecially for pulmonary edema maternal security has been a great challenge, but also bring diluted to lower blood oxygen transport, some

maternal pulmonary edema. Previous studies suggest that [7] 1:3 matching pattern in the plasma colloid osmotic pressure closest to the physiological mode, 1:3 colloid large proportion of the three groups, and therefore infusion liquid spread to the tissue space slowed circulating in the body longer residence time after the end of the input the expansion effect all matching group of the best. Boost drug use statistics, 1:3 group compared with the other two groups maternal vasopressor use shorter, less use of vasopressor dose of maternal the security greater improvement during the intervention.

The selection of this study colloid hydroxyethyl starch injection, the team of researchers and incomparable advantage of hydroxyethyl starch injection and other types of colloidal where I read the literature, concluding hydroxyethyl starch injectionseveral advantages as follows: 1. produces hemodilution, reduce blood viscosity, improve tissue perfusion and improve tissue oxygenation; increase the surface of the red blood cell load, to maintain stable blood formed elements, reduce red blood cell aggregation, improve microcirculation;plugging capillaries, reducing protein leakage, reduce tissue edema, to maintain good osmotic pressure; 4. prevent endothelial cells, white blood cells adhere to each other, to reduce the expression of cell adhesion molecules in the plasma concentration.

In summary, in the cesarean section during surgery, 1:3 milk Ringer solution, hydroxyethyl starch injection ratio by maternal heart rate, blood pressure and other hemodynamic less affected, and reduce treatmentboost during the duration of use and dose of the drug.

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