To The Editor:

I have read with interest the case report of *Tension pneumocranium in childhood trauma* by Gill et al,[1] which appeared in the August issue of *World Journal of Pediatrics*. The authors have presented their case concisely with good documentation. They reported a tension pneumocephalus caused by severe traumatic brain injury, i.e., a "ball valve" opening into a paranasal sinus allowed entry of air into the subdural space through the orbital plate of the frontal bone, and that the laceration with associated fractures may be the main cause of tension pneumocephalus. But another important factor that should not be neglected is the increase of the volume and pressure caused by gas being warmed from room temperature to body temperature. To our knowledge, there is about 4% depending on the compliance of the brain in normal conditions.

The following formula shows the details:

$$\frac{V_1P_1}{T_1}=\frac{V_2P_2}{T_2}$$

$$P_2=\frac{P_1T_2}{T_1}$$

$$P_2=790.6\ \text{mmHg}$$

$$\Delta\%=\frac{790.6-760}{760}=4\%$$

In normal conditions, where P_1=760 mmHg, T_1=298ºK (25ºC), and T_2=310ºK (37ºC).

Considering the characteristics of intracranial pressure-volume curve,[2-4] we suggest the despised changes may cause deadly outcome. Thus clinicians should be aware of this negligible condition.

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The Author Reply:

We are grateful for the valuable addition by our colleague Professor Ouyan Shi from Tianjin Medical University. The point is well taken. However, we are of the opinion that the risk for volume and pressure increase as a result of intracranial gas being warmed may in fact be greater if the gas enters the intracranial space directly from the outside surroundings, such as in a skull fracture over the dome of the cranium. In our case,[1] the gas entered the cranium most likely via the frontal sinusses and it is therefore likely that the gas was already "preheated" by the physiological mechanisms to a certain degree.

We agree however with the principle and thank Professor Ouyan Shi for this oversight.

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