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Needle-free injection of insulin powder: delivery efficiency and skin irritation assessment

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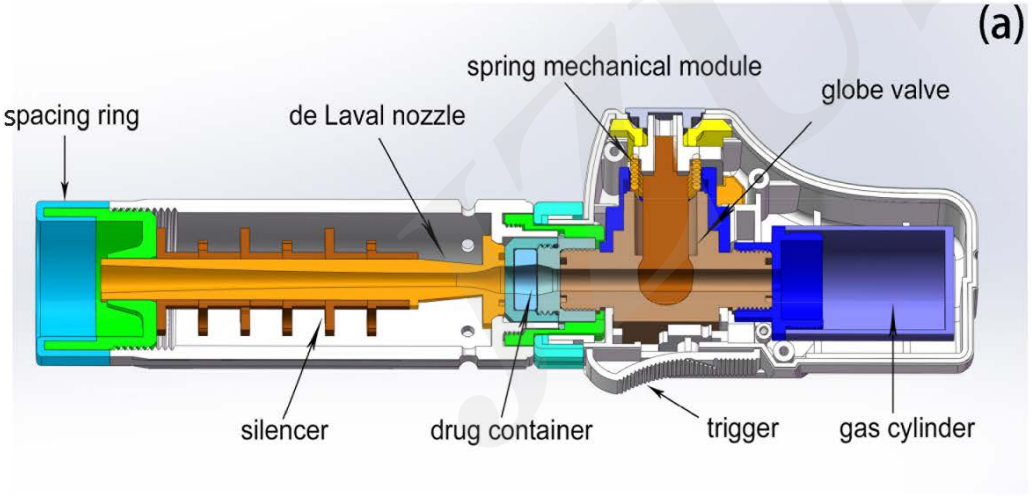
Key words: Powder needleless injection, Insulin, Transdermal drug delivery, Skin irritation

Research Summary

Insulin is widely used in treating diabetes but it still needs to be administered by needle injection. This study investigated a new needle-free delivery approach of insulin. The following aspects are *innovation points*:

1 Automatically mechanical unit design







2 The relative delivery efficiency of insulin powder via a newly designed PNI device was 72.25%。(See in paper: Table 3; Page 12.)

In paper: Table 3(*Page 12)*

Group	AAC	Relative delivery efficiency of PNI	Absolute delivery efficiency of PNI
N/S	152.34±33.87	-	-
N/S-P	58.99±12.66	-	38.72%
PNI-P	42.62±8.58	72.25%	27.98%
PNI-Raw	0.02±0.008	0.03%	0.01%

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3 The optimized injection conditions for the PNI device revealed minimal skin lesions and are safe to use in practice. The resuls are as follows: a gas pressure of 3.5 MPa, a cylinder volume of 5 ml and a nozzle distance of 3.5 cm.
(see in paper:Table 1,Table 2 and Figure 2;Page 7-8.)

