

## GS02-1    **Development of novel treatment for neuropathic pain by improving skin blood flow disorder**

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Neuropathic pain is refractory chronic pain which is developed as diabetic complication or after curing shingles. Therapeutic agents are not sufficient to alleviate pain with adequately addressing to patient needs, and development of novel drug is required. Interestingly, skin blood flow disorder (SBFD) is occurred in diseased area in neuropathic pain patients and model animals. SBFD is thought to be secondary symptom, and not only causal relationship between SBFD and pain but also the pathogenic mechanism of SBDF is not clear. In the present symposium, we report our knowledges about the relationship of pathogenic mechanism of SBDF associated with neuropathic pain. We found that the SBDF is caused by enhanced arterial contractile responses by decreasing  $\text{Na}^+\text{-Ca}^{2+}$  exchanger (NCX) activity following to increase of  $\text{Na}^+$  influx, probably due to activation of transient receptor canonical (TRPC) channel *in vitro*. We also found that vasodilators improved SBDF and alleviated pain *in vivo*. The time courses of the effects of vasodilators on skin blood flow and pain were correlated.

SBDF accompanied to neuropathy is an exacerbation factor of pain, and the alleviation of SBDF is an effective treatment for neuropathic pain.