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A SILICONE OIL-FREE SYRINGE TAILORED FOR INTRAVITREAL INJECTION OF BIOLOGICS

Oral

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Purpose:

Siliconized syringes can deposit silicone oil (SiO) droplets in the vitreous and cause patient discomfort. Our aim was to compare a new SiO-free syringe to commercially available prefilled syringes (PFS) with aflibercept and ranibizumab with regard to release of SiO.

Methods:

We compared the new SiO-free syringe (Zero Residual Silicone Free- ZR, SJJ Solution) with commercially PFS containing ranibizumab and aflibercept by imaging flow cytometry. We also tested two additional syringes, one SiO-free (HSW Norm-Ject) and one siliconized (BD Ultra-Fine). SiO droplets from the syringes with and without agitation were identified by fluorescent labeling of SiO particles. All syringes were attached to a standard 30-gauge siliconized needle.

Results:

The ZR SiO-free syringe released $19,469 \pm 13,448$ particles/mL and $15,803 \pm 12,443$ particles/mL with and without agitation, respectively, whereas the Norm-Ject released $63,558 \pm 69,414$ and $16,438 \pm 10,961$ particles/ml, with and without agitation, respectively. The BD Ultra-Fine released a significantly higher number of particles compared to the SiO-free syringes, reaching $1,870,428 \pm 1,234,150$ particles/ml with agitation. Both aflibercept PFS and ranibizumab PFS showed a considerable number of SiO particles, both with and without agitation ($464,291 \pm 275,350$ particles/mL and $261,243 \pm 56,938$ particles/mL for aflibercept PFS; $138,801 \pm 29,207$ and $80,758 \pm 38,276$ particles/mL for ranibizumab PFS).

Conclusions:

We conclude that commercially available aflibercept and ranibizumab PFS have increased risk of SiO release compared to both the new Zero Residual SiO-free as well as the Norm-Ject. The BD Ultra-Fine released the most SiO particles.

Number of SiO particles

Syringe	Sample size (n)	Not agitated (particles/mL)	Agitated (particles/mL)	p-values
Zero Residual SiO Free	12	15,804 ± 12,443	19,470 ± 13,448	0.496
HSW Norm-Ject	9	16,439 ± 10,961	63,559 ± 69,414	0.077
BD Ultra-Fine	12	177,816 ± 138,655	1,870,429 ± 1,234,151	0.001
Aflibercept PFS	3	261,243 ± 56,938	464,291 ± 275,350	0.329
Ranibizumab PFS	3	80,758 ± 38,276	138,801 ± 29,207	0.110