Background

Nivolumab, anti-PD-1 mAb, is available as concentrated solution for IV injection and diluted in 0.9% saline. These solutions are reported to be physically and chemically stable for 24 h at 2-8 °C and 8 h at 20-25 °C. Since the “real-world” use after dilution in IV infusion bags may exceed the manufacturer’s recommendations, “in-use” studies assessing their stability is important as the formulation components are diluted and may not be able to protect the protein against degradation or denaturation.

Aim and objectives

The aim of this study was to assess physicochemical and microbiological in-use stability of diluted solution of nivolumab stored at 2-8 °C.

Material and methods

Four bags of nivolumab were compounded at concentration of 2 mg/mL with 0.9% saline solution and stored at 2-8 °C over a 7-day period. At selected time points, different methods were used to evaluate stability.

Results

- Diluted nivolumab solutions remained clear and colorless
- All samples were not affected in terms of formation of sub-visible particles or changes in pH or osmolality
- Results of SEC-HPLC analyses revealed no change in high molecular weight (HMW), soluble aggregate, or low molecular weight (LMW), fragmented product.
- Relative ratio remained constant over time
- Gel electrophoresis under both no-reducing and reducing conditions detected no change in band distribution
- No bacterial or fungal contamination after 30 day of storage

Conclusion

These analyses demonstrate that nivolumab under the dilution conditions required for IV infusion can be stored for 7 days at 2-8 °C with no evidences of physical or chemical alteration.