MicroRNAs (miRs) are non-coding RNAs that control post-transcriptional gene expression. The human genome encodes over 1000 miRs that control 60% of genes involved in metabolism, proliferation, apoptosis, neuronal gene expression, muscle differentiation, and stem cell division. The association of miRs with post-void residual urine volume is currently unknown. Increased expression of miR34a and miR25 noted in mouse model of OAB. The goal of our study was to determine if miR expression in bladder may help predict those OAB patients, who are at risk for urinary retention after intradetrusor onabotulinumtoxin-A injection, thereby better predicting this adverse event.

**Methods**

- **13 female patients (mean age = 66.2)** with wet OAB refractory to at least two anticholinergic medications were consented for this IRB approved study.
- Cystoscopic punch bladder biopsy was obtained at the time of injection of 100U of onabotulinumtoxin-A.
- Tissue samples were processed to evaluate the differential expression of 13 unique miRs for each patient.
- Total RNA isolated from biopsy tissue was converted to cDNA so as to assess the differential expression of 13 different miR species, chosen because of their known effect on neurotrophin expression and smooth muscle function.
- Quantitative real time reverse transcription-polymerase chain reaction (qRT-PCR) was performed on the cDNA obtained from each patient in triplicate, and relative levels of expression for selected miR species were normalized to the expression of U6 small nuclear endogenous gene.
- PVRs at the 3 week follow-up post onabotulinumtoxin-A were measured by ultrasound.
- Patients were divided into a low PVR (<200 cc) group and a high PVR (>200 cc) group.
- Expression of miRs were compared between the two PVR groups using Wilcoxon rank-sum test.

**Results**

<table>
<thead>
<tr>
<th>Mean Patient Characteristics</th>
<th>High PVR Group (n = 6)</th>
<th>Low PVR Group (n = 7)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>68</td>
<td>66</td>
<td>0.7</td>
</tr>
<tr>
<td>Pre-Procedure PVR</td>
<td>71</td>
<td>17</td>
<td>0.08</td>
</tr>
<tr>
<td>Post-Procedure PVR</td>
<td>331</td>
<td>50</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

- **2x upregulation** of miR26a noted in high PVR group.
- **2x downregulation** of miR210, miR221, miR125b noted in high PVR group.
- Elevated pre-procedure PVR correlates with elevated post-procedure PVR.

**Interpretation of Results**

- The higher expression of miR210, a neuroprotective mediator against ischemia, was associated with normal PVR after BoNT-A injection.
- Increased miR26a expression, associated with smooth muscle stretching, was associated with high PVR, and this increase could predispose to an increased risk of urinary retention after BoNT-A injection.

**Conclusions**

- There is differential expression of several miRs in patients who develop elevated PVRs following injection of onabotulinumtoxin-A as compared to patients with normal PVRs.
- Further research is needed to determine if miR expression could be used to predict which OAB patients are at risk of urinary retention after intradetrusor onabotulinumtoxin-A injection.

**Disclosure Statement**

The first author has no conflict of interest to disclose with respect to this presentation.