



Review of Intrathecal Inflammatory Mass Formation and Catheter Adhesion in Patients with Intrathecal Drug Delivery Systems



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INTRODUCTION

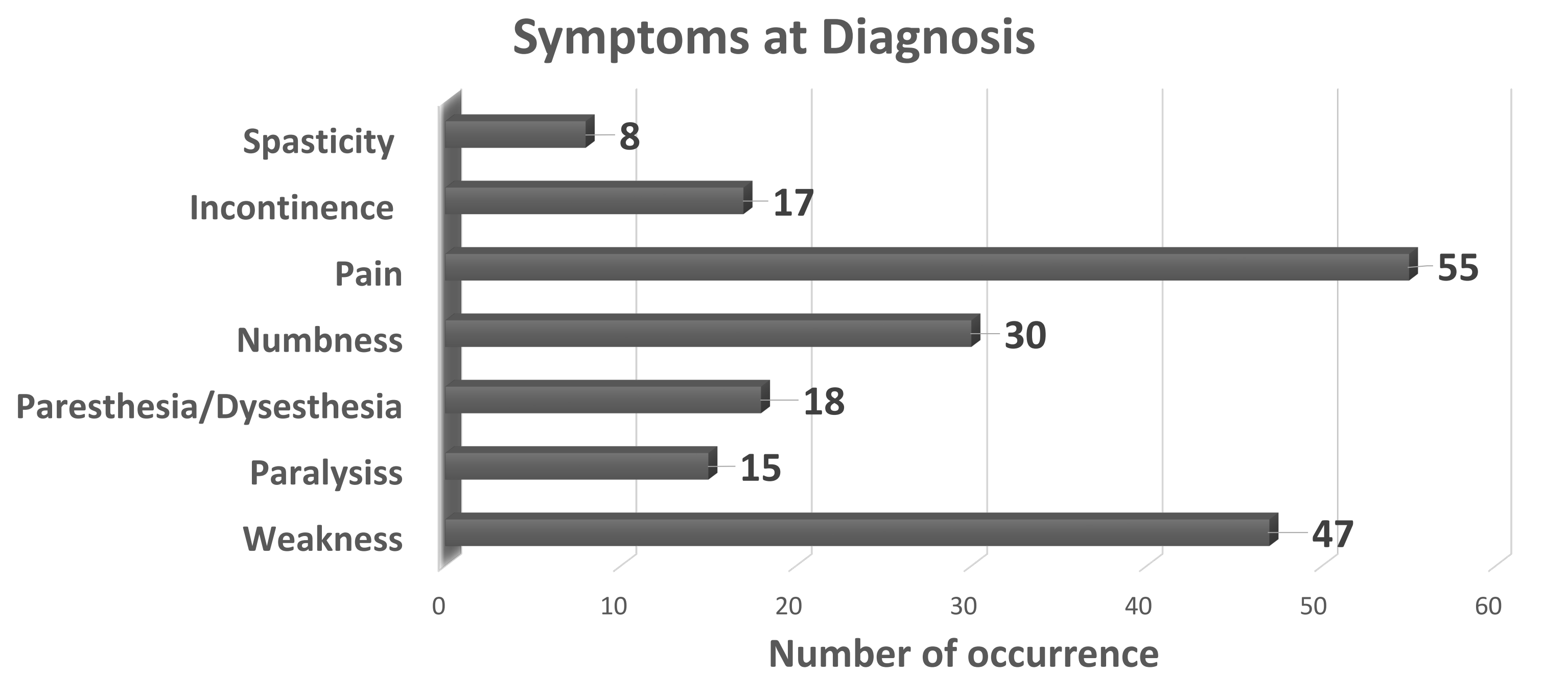
- Intrathecal drug delivery systems (IDDS) are indicated for patients with oral therapy-resistant pain, spasticity, and dystonia. This method directly activates spinal opioid receptors, resulting in a significant reduction in systemic opioid dosages and a sustained drug infusion lasting weeks to months¹.
- A significant, often overlooked complication is catheter-tip inflammatory mass (IM) development, which can obstruct the catheter, compromising pain management and potentially causing permanent neurological deficits due to spinal cord pressure².
- Exact cause and pathophysiology remain elusive, with reported prevalence rates varying (possibly underestimated). Diagnosis relies on clinical, imaging, and histopathological evaluation. Treatment options include surgical excision, catheter replacement, or system discontinuation³.

METHOD

- Objective:** This presentation reviews IDDS-related intrathecal inflammatory masses and adhesions, covering clinical aspects, diagnosis, management, and the current understanding of their pathophysiology.
- Method:** We followed PRISMA guidelines, conducting a systematic review of research from 1981 to 2023 in databases such as Embase, PubMed, and Google Scholar. We focused on adult patients with chronic pain, spasticity, or cancer pain who received intrathecal drug delivery. Two reviewers independently assessed studies meeting PICOS criteria, resolving discrepancies through discussion or third-party consultation. We used Covidence for systematic review management, including tasks like abstract screening, full-text review, data extraction, risk of bias analysis, and data exportation for analysis.
- Results:** Initially, 1544 studies were identified. Of these, 976 were removed due to duplication, leaving 568 unique studies. Subsequently, during the abstract screening, 367 were deemed irrelevant, leaving 201 studies. After a full-text review, 57 papers were included in the final analysis.

RESULT

Women	53
Men	41
Not Reported	16
Average Age (years)	55.3
Standard Deviation of Age (years)	12.4
Average time to Diagnose (months)	49.9
Standard Deviation of time to Diagnose (months)	47.9



Drugs	Average Dose (mg/d)	Average Concentration (mg/ml)	Number of Occurrence
Morphine	19.64±21.61	36.55±18.39	72
Hydromorphone	13.33±22.55	36.37±78.35	23
Bupivacaine	12.41±11.02	21.77±11.34	31
Clonidine	0.46±0.45	0.67±0.76	23
Baclofen	0.55±0.62	1.31±1.44	8
Fentanyl	3.29±3.42	4.50±5.43	5
Methadone	4.65±1.91	17.50±10.61	2
Sufentanil	0.02±0.33	0.08±0.12	2
Tramadol	22.00±9.90	50.0	2
Ziconotide	0.01±0.01	0.01±0.01	5

RESULT

- In the dataset, 58% of patients exhibit polypharmacy in their IDDS, while 42% have monotherapy.
- The most common diagnosis modalities are MRI and CT myelogram.
- Among the 64 patients who underwent mass excision, 45 improved, 16 remained the same, and 3 worsened.
- Among 14 patients who stopped the infusion or switched to normal saline, 13 experienced symptom improvement, while 1 worsened.
- Among the 16 patients who had their catheters replaced, 14 showed improvement, while 2 remained the same.
- There were 24 reports of adherence from granuloma to the thecal or spinal cord, but no cases of direct catheter adhesion to these structures.

CONCLUSION

- The average time for a patient from system implant to the diagnosis of IM is 4-5 years. Therefore, healthcare providers should consider scheduling routine check-ups accordingly.
- Given the wide range of possible presentations, it's essential for clinicians to engage in proactive patient monitoring. This becomes particularly significant when addressing issues such as inadequate pain control and the emergence of weakness, as these represent the most frequently encountered symptoms.
- Morphine, hydromorphone, and bupivacaine are the most frequent drugs in this dataset. However, given their common usage in the IDDS, significant conclusions cannot be made. Further research is necessary to understand the relationship between drugs, dosages, concentrations, and the formation of IM.
- Among the 24 case reports of granuloma with adhesion to nearby structures, none have shown a direct catheter adhesion to the spinal cord. To our knowledge, we will be the first to present such a case at our other poster.

REFERENCES

