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Factors affecting late diagnosis of developmental dysplasia of the hip

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Introduction

Developmental dysplasia of the hip (DDH), a condition affecting 1-3% of newborns, is the result of a failure in the normal development of the hip (Sewell et al. 2009). The term DDH describes the spectrum of hip defects ranging from acetabular dysplasia to frank dislocation. If left untreated these abnormalities can result in long term complications such as gait abnormalities, pain, and early onset osteoarthritis. DDH presently accounts for 29% of all hip replacements performed in patients under the age of 60 (Sewell et al. 2009).

Given a timely diagnosis and appropriate treatment the risk of long term sequelae is significantly diminished. The first-line treatment for DDH involves non-invasive management with a Pavlik Harness or other abduction orthosis. The timeline for an optimal response to Pavlik Harness treatment is within the first few months of life. As the child ages, however, the risk of failing first line treatment and requiring surgical reduction increases dramatically. Hips that require surgical reduction are at an increased risk for re-dislocation, functional limitation, and early onset osteoarthritis. Current Canadian guidelines dictate that all newborns should be screened for DDH at every primary care visit until they are able to walk (Patel 2001). This screening is done by physical examination of the child's hip. Signs of DDH on physical examination are asymmetric thigh skin folds, limb length discrepancy, limited hip abduction and hip instability noted on Barlow or Ortolani maneuvers.

Our study aimed to identify the rate of late diagnosis DDH in Southwestern Ontario due to concerns over the number of surgical reductions being performed at the London Health Sciences Center. Furthermore, we hoped to identify any factors that could be contributing to the rate of late diagnosis that we observed. It was our hope that the identification of these factors would allow us to address any potential deficiencies that may exist in our screening practices. We hypothesized that community centers are less exposed to patients that require the care of paediatric subspecialists, and as a result, an association would be found between patients referred from a community center and patients receiving a delayed diagnosis of DDH.

Methods

We performed a retrospective chart review of 114 patients diagnosed and treated for DDH at the London Health Sciences Center between January 1, 2006 and March 2, 2014. Patients were grouped based on the timeline of their diagnosis as well as the location of their original referral. Our early and late diagnosis patients were divided based on a diagnosis made before or after three months of life. Our community and urban groups were divided between those patients referred from London, Ontario (urban) and those patients referred from any other center (community).

Our inclusion criteria was treatment for DDH within our study timeframe. Our exclusion criteria was a diagnosis of syndromic hip dysplasia or teratologic dislocated hip. All data was collected using Cerner’s Powerchart and GE Healthcare’s Centricity.

Our study included 114 patients of which 87% were female and 13% were male. With regards to the affected hip 46% of patients suffered developmental dysplasia of their left hip, 22% their right hip, and 32% had DDH of both hips. Seventy-seven percent of patients were referred from a community center and 23% were referred from an urban center.

Of all cases in our study 48% received a late diagnosis of DDH. However, we did not find an association between the patients referred from community centers and the patients who received a late diagnosis of DDH ($\chi^2(2,N=114) = 2.344, p=0.126$). On secondary analysis an association was found between patients having no known risk factors for DDH and patients receiving a late diagnosis ($\chi^2(2,N=114) = 5.254, p < 0.05$).

Results

Our study showed very similar demographics to the risk factor distribution reported in the literature (Azzopardi et al. 2011). Therefore, it is clear that many patients with known risk factors for DDH are also receiving a late diagnosis. There are many factors that may be contributing to this high incidence such as inconsistent screening practices, a lack of awareness of DDH and its associated risk factors, and a lack of adequate teaching at both the undergraduate and resident level in the detection of DDH. All of these factors may play a role in our current detection rates, and we believe that a strong emphasis on awareness and education may improve our detection rates.

Discussion

While a majority of DDH cases are being detected and treated well within the clinical guideline time frame we believe that efforts to improve awareness and education of DDH in Southwestern Ontario will help to further improve our rate of early detection. Potential next steps in our investigation may include formal surveys of physicians, residents, and medical students to assess their level of awareness of DDH as well as their comfort level in diagnosing this condition. These surveys will allow us to gauge and hopefully address any deficiencies that may exist in DDH education at this time.

Conclusion

Of all cases in our study 48% received a late diagnosis of DDH. However, we did not find an association between the patients referred from community centers and the patients who received a late diagnosis of DDH ($\chi^2(2,N=114) = 2.344, p=0.126$). On secondary analysis an association was found between patients having no known risk factors for DDH and patients receiving a late diagnosis ($\chi^2(2,N=114) = 5.254, p < 0.05$).

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